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DERMAL, EYE AND ORAL TOXICOLOGIC EVALUATIONS Of Brass Powder, Fog Oil, Diesel Fuel, and Their Mixtures.

Phase III Report

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19. ABSTRACT (Continue on reverse if necessary and identify by block number)

Five test articles were evaluated to establish their eye and skin irritation potential and their oral and dermal toxicity. The test articles evaluated were as follows: 1) Brass Powder, 2) Fog Oil, 3) Diesel Fuel, 4) 0.75 parts Fog Oil:1 part Brass Powder (w/w mixture), and 5) 0.7 parts Diesel Fuel:1 part Brass Powder (w/w mixture). Oral studies were conducted utilizing the Fischer-344 albino rat as the test system; all other studies utilized the New Zealand White Albino Rabbit as the test system. The results obtained in these studies are summarized by test article below:

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Block 19 (continued):

- Brass Powder was found to be a mild skin irritant (calculated primary irritation index was 2.0); tested positive for eye irritation; had a dermal LD50 greater than 2 g/kg; and an oral LD50 of 1586.9 mg/kg in males, 1696.1 mg/kg in females and 1561.2 mg/kg for the combined sexes.

-Fog Oil was found to be a moderate skin irritant (calculated primary irritation index was 3.8); tested negative for eye irritation; had a dermal LD50 greater than 2 g/kg; and an oral LD50 greater than 5 g/kg.

- Diesel Fuel was found to be a moderate skin irritant (calculated primary irritation index was 4.0); tested negative for eye irritation; had a dermal LD50 greater than 2 g/kg; and an oral LD50 greater than 5 g/kg.

- 0.75 parts Fog Oil:1 part Brass Powder mixture was found to be a severe skin irritant (calculated primary irritation index was 5.6); tested negative for eye irritation; had a dermal LD50 greater than 2 g/kg; and an oral LD50 greater than 5 g/kg.

- 0.7 parts Diesel Fuel:1 part Brass Powder mixture was found to be a severe skin irritant (calculated primary irritation index was 7.7); tested negative for eye irritation; had a dermal LD50 greater than 2 g/kg; and an oral LD50 greater than 5 g/kg.

EXECUTIVE SUMMARY

Primary dermal, eye irritation potential and acute dermal toxicity tests were conducted in rabbits and acute oral otoxicity tests were conducted in rats. The test articles evaluated were: (1) Brass Powder; (2) Fog oil; (?) Diesel Fuel; (4) Ø.75 parts Fog Oil: 1 part Brass Powder (w/w/mixture); (5) Ø.7Ø parts Diesel Fuel: 1 part Brass Powder (w/w/mixture). The results of these experiments are summarized below followed by an overall summary chart.

- Brass Powder was found to be a mild skin irritant (calculated primary irritation index was 2.Ø); tested positive for eye irritation; had a dermal LDSØ greater than 2 g/kg; and an oral LDSØ of 1586.9 mg/kg in males, 1696.1 mg/kg in females and 1561.2 mg/kg for the combined sexes. Histopathologic examination of test and untreated skin sites from 2 males and 2 females used in the dermal toxicity study revealed treated skin from one male had mild dermal edema and fragmentation of collagen and the other male had minimal hyperkeratosis and focal keratotic entrapment of the test material and debris. All the untreated skin specimens and the treated skin from both female rabbits were judged to be unremarkable.

- Fog Oil was found to be a moderate skin irritant (calculated primary irritation index was 3.8); tested negative for eye irritation; had a dermal LDSØ greater than 2 g/kg; and an oral LDSØ greater than 5 g/kg. Histopathologic examination of the test and untreated skin sites from 2 males and 2 females used in the dermal toxicity study revealed mild to moderate responses to irritation characterized by acanthosis, hyperkeratosis, and an acute inflammatory infiltrate of the dermis in the treated skin of both male rabbits. All the untreated skin specimens and the treated skin from both female rabbits were judged to be unremarkable.

- Diesel Fuel was found to be a moderate skin irritant (calculated primary irritation index was 4.Ø); tested negative for eye irritation; had a dermal LDSØ greater than 2 g/kg; and an oral LDSØ greater than 5 g/kg. Microscopic examinations performed on single sections of treated and untreated skin from 2 males and 2 females used in the dermal toxicity study and sacrificed on study day 14, and on the 1 male rabbit found dead on test day 13 revealed minimal to marked changes in all the treated skin specimens. This animal's death was considered to be due to mucoid enteropathy and not the test article. Hyperkeratosis was seen in 5/5, acanthosis in 4/5, acute dermatitis in 4/5, and abscesses or microabscesses in 2/5 of the rabbits. All the untreated skin specimens were judged to be unremarkable.

- 0.75 parts Fog Oil:1 part Brass Powder was found to be a severe skin irritant (calculated primary irritation index was 5.6); tested negative for eye irritation; had a dermal LD50 greater than 2 g/kg; and an oral LD50 greater than 5 g/kg. Histopathologic examination of treated and untreated skin sites from 2 males and 2 females used in the dermal toxicity study revealed mild to moderate hyperkeratosis accompanied by minimal acanthosis and acute dermatitis in the treated skin specimens from both male rabbits. Similar, but less severe lesions, were seen in both the female rabbits. All the untreated skin specimens were judged to be unremarkable.

- 0.7 parts Diesel Fuel:1 part Brass Powder was found to be a severe skin irritant (calculated primary irritation index was 7.7); tested negative for eye irritation; had a dermal LD50 greater than 2 g/kg; and an oral LD50 greater than 5 g/kg. Microscopic examinations performed on single sections of treated and untreated skin from two males and two females used in the dermal toxicity study revealed minimal to mild hyperkeratosis and acanthosis in all the treated skin specimens. Minimal dermal edema and acute dermatitis were seen in one male and one female rabbit, respectively. All the untreated skin specimens were judged to be unremarkable.

SUMMARY OF RESULTS

TEST ARTICLE	PRIMARY DERMAL	PRIMARY EYE	ACUTE DERMAL	ACUTE ORAL
Brass Powder	PII 2.0 (Mildly Irritating)	Positive	NT-RD (LD50 >2 g/kg)	9 of 10 de (LD50-Male 1586.9 mg/ LD50-Femal 1696.1 mg/ LD50-Combi Sexes 1561 mg/kg)
Fog Oil	PII 3.8 (Moderately Irritating)	Negative	NT-RD (LD50 >2 g/kg)	NT-RD (LD50 >5 g/kg)
Diesel Fuel	PII 4.0 (Moderately Irritating)	Negative	NT-RD (LD50 >2 g/kg)	NT-RD (LD50 >5 g/kg)
Fog Oil and Brass Powder (0.75:1)	PII 5.6 (Severely Irritating)	Negative	NT-RD (LD50 >2 g/kg)	NT-RD (LD50 >5 g/kg)
Diesel Fuel and Brass Powder (0.75:1)	PII 7.7 (Severely Irritating)	Negative	NT-RD (LD50 >2 g/kg)	NT-RD (LD50 >5 g/kg)

KEY: PII denotes Primary Irritation Index.
NT-RD denotes No Treatment-Related Deaths.

FOREWORD

All work relating to this study was done in conformity with the FDA Good Laboratory Practice Regulations.

Sandra H. Smith 9/4/86
Sandra H. Smith Date
Toxicologist

Dale A Mayhew 9/4/86
Dale A. Mayhew, Ph.D. Date
Principal Investigator

The study was inspected during its progress, by a Quality Assurance Specialist according to ABC Standard Operating Procedure (SOP) for inspecting acute studies. Management was informed at once of any serious problems found.

The data in the report were compared with the raw data and are in agreement. The report and study file were examined to assure that any problems found during Quality Assurance inspections or audits were corrected, and if necessary, their effect on the study documented. (See Appendix A)

Antoinette Skelley 9/4/86
Antoinette Skelley Date
Manager, Quality Assurance
and Regulatory Affairs

All raw data relating to this study will be stored at ABC. Storage will conform to FDA regulations as per ABC SOP's and may include volume reduction by conversion to certified microform.

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INTRODUCTION

At the request of the U.S. Army Medical Research and Development Command, short term/standard acute studies were conducted on 5 test articles to evaluate their irritation (eye and skin) and toxicity (oral and dermal) potential. The materials tested were 1) Brass Powder, 2) Fog Oil, 3) Diesel Fuel, 4) a Brass Powder and Fog Oil mixture, and 5) a Brass Powder and Diesel Fuel mixture. Studies were conducted at American Biogenics Corporation (ABC), Decatur, IL facilities, from May 28, 1985 to September 19, 1985.

MATERIALS & METHODS

A. Test System/Husbandry

The study outline presents the study number, test article used, type of study, species, strain, supplier, body weight range, and duration for each study. Young adult animals were used for each study. The rat and rabbit are the species preferred for acute toxicological testing.

Animals were housed individually in stainless steel, wire-bottomed cages that conformed to the size standards specified in DHEW Publication (NIH) 78.23. The cages on each rack were numbered consecutively and a list of random numbers was generated by computer program* for each rack of cages. After receipt, each animal was removed from the shipping container and housed in the appropriate randomly selected cage. Each animal was then assigned a sequential animal number unique within ABC and identified with an ear tag bearing this animal number. The sequential animal number was listed on a cage card that was affixed to the front of the animal's cage.

The rabbits were quarantined for at least 14 days after receipt and the rats were quarantined for at least 7 days after receipt. Veterinary Sciences personnel observed the animals during quarantine for mortality, morbidity, and abnormal signs. Animals were examined during quarantine and only those considered to be in good health were used in these studies.

The quarantine and study rooms were cleaned daily and the cages were cleaned and sanitized as specified in ABC SOP's (B-17 and B-21). Urine and feces fell through the wire mesh floor onto animal caging board. The cage boards were changed at least 2 to 3 times per week.

The animal rooms were well ventilated and air-conditioned. The temperature and humidity were monitored daily during the quarantine and study periods according to ABC SOP (B-12). ABC temperature and humidity ranges for rabbits are 67 +5°F and 30-70%, respectively, and for rats are 73 +5°F and 30-70%, respectively. Any deviations in these ranges are noted in the raw data and were not considered to have effected the outcome of the studies.

The animal rooms were lighted from approximately 6:00 a.m. to 6:00 p.m. (12 hour light/dark cycle) using automatic timers.

Purina Certified Rodent Chow 5002, and Purina Certified Rabbit Chow 5322 were fed to the rats and rabbits, respectively, ad libitum during the quarantine and study periods except for fasting of rats prior to dosing. Filtered tap water was provided ad libitum through an automatic watering system and was analyzed periodically as specified in ABC SOP (B-27).

* Method adapted from Carnahan, Luther, and Wilkes, Applied Numerical Methods, Wiley, 1969.

STUDY OUTLINE

Study Number	Test Article	Type of Study	Species	Strain	Supplier	Body Weight Range at Study Start*	Duration of Study
418-2133	Brass Powder	Primary Dermal Irritation	Albino Rabbit	New Zealand White	C	2.08 - 2.76 kilograms	5/28/85 - 6/03/85+
418-2134	Brass Powder	Primary Eye Irritation	Albino Rabbit	New Zealand White	C	2.28 - 2.38 kilograms	5/28/85 - 6/11/85
418-2135	Brass Powder	Acute Dermal Toxicity	Albino Rabbit	New Zealand White	C	2.34 - 2.82 kilograms	6/06/85 - 6/20/85
418-2136	Brass Powder	Acute Oral Toxicity	Albino Rat	Fischer F-344	CR	Males, 175 - 245g Females, 138 - 186g	5/30/85 - 6/13/85
		Acute Oral LD50					8/06/85 - 9/19/85
418-2137	Fog Oil	Primary Dermal Irritation	Albino Rabbit	New Zealand White	C	2.0 - 2.56 kilograms	5/28/85 - 6/03/85
418-2138	Fog Oil	Primary Eye Irritation	Albino Rabbit	New Zealand White	C	2.04 - 2.34 kilograms	5/28/85 - 5/31/85
418-2139	Fog Oil	Acute Dermal Toxicity	Albino Rabbit	New Zealand White	C	2.04 - 2.70 kilograms	6/05/85 - 6/19/85
418-2140	Fog Oil	Acute Oral Toxicity	Albino Rat	Fischer F-344	CR	Males, 166 - 186g Females, 147 - 157g	5/30/85 - 6/13/85
418-2141	Diesel Fuel	Primary Dermal Irritation	Albino Rabbit	New Zealand White	C	2.06 - 2.52 kilograms	5/28/85 - 6/07/85
418-2142	Diesel Fuel	Primary Eye Irritation	Albino Rabbit	New Zealand White	C	2.10 - 2.32 kilograms	5/28/85 - 5/31/85
418-2143	Diesel Fuel	Acute Dermal Toxicity	Albino Rabbit	New Zealand White	C	2.14 - 2.66 kilograms	6/06/85 - 6/20/85
418-2144	Diesel Fuel	Acute Oral Toxicity	Albino Rat	Fischer F-344	CR	Males, 166 - 178g Females, 144 - 156g	5/29/85 - 6/12/85

+ = Skin reactions had subsided by 6/02/85, animals sacrificed on the next normal working day.
g = grams.
C = Clerco Research Farms, Cincinnati, OH.
CR = Charles River Breeding Laboratories, Inc. (Kingston, NY facility).
L = Langshaw Farms, Augusta, MI.
* = Fasted body weights for rats.

STUDY OUTLINE

Study Number	Test Article	Type of Study	Species	Strain	Supplier	Body Weight Range at Study Start*	Duration of Study
410-2145	0.75 Parts Fog Oil: 1 Part Brass Powder	Primary Dermal Irritation	Albino Rabbit	New Zealand White	C	2.0 - 2.42 kilograms	5/28/85 - 6/06/85
410-2146	0.75 Parts Fog Oil: 1 Part Brass Powder	Primary Eye Irritation	Albino Rabbit	New Zealand White	C	2.24 - 2.54 kilograms	5/28/85 - 5/31/85
410-2147	0.75 Parts Fog Oil: 1 Part Brass Powder	Acute Dermal Toxicity	Albino Rabbit	New Zealand White	C	2.42 - 2.98 kilograms	6/05/86 - 6/19/85
410-2148	0.75 Parts Fog Oil: 1 Part Brass Powder	Acute Oral Toxicity	Albino Rat	Fischer F-344	CR	Males, 168 - 178g Females, 138 - 158g	5/29/85 - 6/12/85
410-2149	0.7 Parts Diesel Fuel: 1 Part Brass Powder	Primary Dermal Irritation	Albino Rabbit	New Zealand White	C	2.14 - 2.66 kilograms	5/28/85 - 6/11/85
410-2150	0.7 Parts Diesel Fuel: 1 Part Brass Powder	Primary Eye Irritation	Albino Rabbit	New Zealand White	C	2.0 - 2.40 kilograms	5/28/85 - 5/31/85
410-2151	0.7 Parts Diesel Fuel: 1 Part Brass Powder	Acute Dermal Toxicity	Albino Rabbit	New Zealand White	L	2.12 - 2.38 kilograms	6/06/85 - 6/20/85
410-2152	0.7 Parts Diesel Fuel: 1 Part Brass Powder	Acute Oral Toxicity	Albino Rat	Fischer F-344	CR	Males, 166 - 180g Females, 143 - 157g	5/29/85 - 6/12/85

+ = Skin reactions had subsided by 6/02/85, animals sacrificed on the next normal working day.
g = grams.
C = Clerco Research Farms, Cincinnati, OH.
CR = Charles River Breeding Laboratories, Inc. (Kingston, NY facility).
L = Langshaw Farms, Augusta, MI.
* = Fasted body weights for rats.

B. Test Articles

The identification and amount used of each test article are listed below:

ABC Code Number	Sponsor Identification	Amount of Test Article Used
3/85-986	Brass Powder* (Particulate SBP #14 [Copper Zinc Powder]) *See Appendix E for composition	131.29 grams
3/85-986-2		73.76 grams
3/85-987	Fog Oil	106.98 grams
3/85-988	Diesel Fuel	117.05 grams
3/85-987+ 3/85-986	0.75 parts Fog Oil: 1 part Brass Powder	N/A
3/85-988+ 3/85-986	0.7 parts Diesel Fuel: 1 part Brass Powder	N/A

N/A = Not applicable; included in the individual material quantities given above.
+ Mixtures were prepared using a weight/weight ratio.

Test articles were provided by the Sponsor and test article code numbers were assigned when the materials were received. ABC Code Nos. 3/85-986 and 986-2 were received from the U. S. Army, and ABC Code Nos. 3/85-987, 988 were received from Martin Marietta Energy System, Inc., Oak Ridge, Tennessee. Records concerning the test article purity, source, and other data required by GLP's are the responsibility of the Sponsor. The test articles were stored under ambient conditions at this laboratory.

The usages of the different test articles are described as follows:

Brass Powder -

- Moistened with propylene glycol prior to application, 0.5 gram per patch, and test sites wiped off with propylene glycol following application/exposure interval for Primary Dermal Irritation Test.

- Moistened with propylene glycol prior to application and test sites wiped off using propylene glycol following application/exposure interval for Acute Dermal Toxicity Test. The amount of test article applied per square centimeter for each animal was calculated to be 21.8 milligrams for the Acute Dermal Toxicity Test.

- Suspended in corn oil using a 50% weight/volume ratio for administration of the Acute Oral Toxicity Test.

- Instilled neat, 0.1 gram per eye, for the Primary Eye Irritation Test.

Fog Oil -

- The density was determined by ABC personnel to be 899.2 milligrams per milliliter.

- Applied neat, 0.5 milliliter per patch, and test site wiped off using water following application/exposure interval for the Primary Dermal Irritation Test.

- Applied neat and test sites wiped off using water following the application/exposure interval for the Acute Dermal Toxicity Test. The amount of test article applied per square centimeter for each animal was calculated to be 21.9 milligrams for the Acute Toxicity Test.

- Administered neat for the Acute Oral Toxicity Test.

- Instilled neat, 0.1 milliliter per eye, for Primary Eye Irritation Test.

Diesel Fuel -

- The density was determined by ABC personnel to be 839.9 milligrams per milliliter.

- Applied neat, 0.5 milliliter per patch, and test sites wiped off following application/exposure interval using water for the Primary Dermal Irritation Test.

- Applied neat and sites wiped off following application/ exposure interval using water for the Acute Dermal Toxicity Test. The amount of test article applied per square centimeter for each animal was calculated to be 20.7 milligrams for the Acute Dermal Toxicity Test.

- Administered neat for the Acute Oral Toxicty Test.

- Instilled neat, 0.1 milliliter per eye, for the Primary Eye Irritation Test.

0.75 parts Fog Oil:1 part Brass Powder -

- The density was determined by ABC personnel to be 1,732.0 milligrams per milliliter. The mixture was prepared prior to each use.

- Applied neat, 0.5 gram per patch, and test sites wiped off following application/exposure interval using propylene glycol for the Primary Dermal Irritation Test.

- Applied neat and sites wiped off following application/ exposure interval using propylene glycol for the Acute Dermal Toxicity Test. The amount of test article applied per square centimeter for each animal was calculated to be

24.1 milligrams for the Acute Dermal Toxicity Test.

- Administered neat for the Acute Oral Toxicity Test.

- Instilled neat, 0.1 gram per eye, for the Primary Eye Irritation Test.

0.7 parts Diesel Fuel:1 part Brass Powder -

- The density was determined by ABC personnel to be 1,641.7 milligrams per milliliter. The mixture was prepared prior to each use.

- Applied neat 0.5 gram per patch, and test sites wiped off following application/exposure interval using propylene glycol for the Primary Dermal Irritation Test.

- Applied neat and sites wiped off following application/exposure interval using propylene glycol for the Acute Dermal Toxicity Test. The amount of test article applied per square centimeter for each animal was calculated to be 20.1 milligrams for the Acute Dermal Toxicity Test.

- Administered neat for the Acute Oral Toxicity Test.

- Instilled neat, 0.1 gram per eye, for the Primary Eye Irritation Test.

C. Experimental Design

Each test and the procedures thereof for each test article are described below.

1. Primary Dermal Irritation

The duration of the study was at least 72 hours after test article application, but not more than 21 days. See Study Outline (pages 11 and 12) for the specific duration of each study. Groups consisting of 3 male and 3 female rabbits were used.

Animals were assigned to each study by sequential animal number except for the elimination of any animal deemed unsuitable. Two (2) application sites were prepared on either side of the thoracic region spinal column of each animal by closely clipping the hair with Oster electric clippers equipped with a number 40 (surgical) blade; the prepared sites were examined and only animals free of dermal lesions/irritations were assigned to each study.

The right anterior and left posterior application sites were abraded with a needle to penetrate the stratum corneum but not the dermis. The other application sites were left intact. One-half (0.5) milliliter of a liquid, or 0.5 gram of a solid or semi-solid, were either applied neat or moistened with an appropriate vehicle and applied to each 2.5 centimeter square gauze patch. While each animal was manually immobilized, 1 patch containing the test article was applied to each application site and held in place with gauze wrapping. The entire trunk of each animal was then wrapped with plastic wrap and stockinette.

After 24 hours of exposure, the bandage and patches were removed. Each test site was gently wiped with gauze sponges moistened with an appropriate vehicle (known not to cause any dermal toxic reactions) to remove any remaining test article. The skin condition of each test site was evaluated for erythema, edema, and other lesions at 24 and 72 hours (+2 hours at each interval) and daily thereafter to day 21 or until irritation had subsided. Dermal reaction scores were assigned using the grading system presented in Appendix B of this report.

Each animal was weighed prior to application of each test article.

All animals were observed at least once daily for mortality and obvious toxic signs.

At the termination of each study, animals were euthanized by administration of an intravenous injection of T-61 Euthanasia Solution and discarded.

The Primary Irritation Score was calculated for each test article as follows: the average scores for erythema and eschar formation for intact and abraded skin at 24 (+2) and 72 (+2) hours were added to the average scores for edema for intact and abraded skin at 24 (+2) and 72 (+2) hours. The total of the 16 values was divided by 8 to give the Primary Irritation Score.

Based upon the mean Primary Irritation Score, the test article was given a descriptive irritation rating using the following method:

Mean Primary Irritation Score (Range of Values)	Descriptive Reading
0.0	Non-irritating
0.1 - 0.5	Practically non-irritating
0.6 - 2.0	Mildly irritating
2.1 - 5.4	Moderately irritating
5.5 and above	Severely irritating

2. Primary Eye Irritation

The duration of the study was at least 72 hours after instillation, but not more than 21 days. See the Study Outline for the specific duration for each study. Groups consisting of 3 rabbits, male or female, were used.

Both eyes of each animal were evaluated within 24 hours prior to instillation of each test article using the evaluation system presented in Appendix C. Animals were assigned to the study by sequential animal number. However, any animal deemed unsuitable was not used and the next acceptable sequentially numbered animal was used.

One-tenth (0.1) milliliter of a liquid test article, or 100 milligrams of a solid or semi-solid test article, were instilled onto the everted lower lid of the right eye of each animal. The upper and lower lids were held together for approximately 1 second to prevent loss of the test article and to ensure even distribution of the test article over the surface of the eye.

The treated eye of each animal was examined for ocular irritation and lesions at 24, 48 and 72 hours (+2 hours at each interval). The treated eyes were evaluated on days 7, 14, and 21 if irritation persisted. Each study was terminated after 21 days or when irritation subsided after the 72 hour evaluations. The evaluation system presented in Appendix C of the report was used for scoring ocular reactions. A pocket flashlight without magnification and a 2 percent sodium fluorescein solution in deionized water were used at all evaluation intervals.

Each animal was weighed prior to instillation of each test article.

The animals were observed at least once daily for mortality and obvious toxic signs.

All animals were sacrificed at the termination of the study by administration of an intravenous injection of T-61 Euthanasia Solution and discarded.

The mean Primary Eye Irritation Score with standard deviation and standard error values was calculated at each evaluation interval using the total scores of each treated eye.

An animal was considered to have exhibited a positive response if the test article produced one or more of the following signs:

- ulceration of the cornea
- opacity of the cornea
- inflammation of the iris
- obvious swelling in the conjunctivae with partial eversion of the eyelid
- a diffuse crimson color

3. Acute Oral/Acute Oral LD50 Toxicity

The duration of each study was 14 days after dosing. Groups consisting of 5 males and 5 females were used for each test article/test group.

Animals were assigned to each study by sequential animal number. However, any animal deemed unsuitable was not used and the next acceptable sequentially numbered animal was used.

The animals were fasted overnight. The following morning, body weights were recorded, doses were calculated, and a measured volume of the test article or suspension was delivered to each animal by oral gavage in a single dose. Diet was returned to the cage of each animal immediately after administration of the Fog Oil and Brass Powder test articles. For all other test articles, diet was returned to the cage of each animal approximately 3 hours after test article administration.

Animals were observed frequently for mortality and toxic signs after dosing on day 0. Thereafter, observations for mortality and toxic signs were done at least once daily. Body weights were recorded prior to test article administration on day 0, and on days 3, 7, 10 and prior to sacrifice on day 14, or at the time found dead.

On day 14, all surviving animals were rendered unconscious by exposure to carbon dioxide and exsanguinated prior to necropsy; those that succumbed were necropsied as soon as possible after death was noted. The following of each animal

were examined and all abnormal findings were recorded: all external surfaces and orifices, and abdominal, thoracic, and pelvic cavities and their viscera. Necropsies were conducted under the supervision of a pathologist. The mean, standard deviation, and standard error were calculated for the body weight data and for the amount of test article administered.

The oral LD50 value, the 95 percent confidence interval, the slope of the dose-response curve, and correction factors for 0 and 100 percent observed responses were calculated by computer program using the method of Litchfield and Wilcoxon.+

4. Acute Dermal Toxicity

The duration of each study was 14 days after test article application. Groups consisting of 5 males and 5 females were used for each test article.

Animals were assigned to the study by sequential animal number. However, any animal deemed unsuitable, including any animal exhibiting dermal lesions, was not used and the next acceptable sequentially numbered animal was used.

The dorsal and lateral trunk (approximately 10% of the body surface area) of each animal was clipped free of hair with Oster electric clippers equipped with a number 40 (surgical) blade.

On the day of dosing, body weights were recorded and doses were calculated. Approximately 24 (+2) hours after clipping, each animal received longitudinal abrasions every 2 to 3 cm. The abrasions were deep enough to penetrate the stratum corneum, but not the dermis. The test articles were applied on a 6 inch by 6 inch pad and placed over the dorsal surface area. Liquid test articles were applied to the pad as received. Solid test articles were moistened with an appropriate vehicle to form a paste and applied to the pad. The test article was held in contact with the skin with gauze wrapping. The entire trunk was then wrapped with plastic wrap and stockinette.

After 24 hours of exposure, the bandage and pads were removed. Each application site was gently wiped with gauze sponges moistened with an appropriate vehicle (known not to cause any dermal toxic reactions) to remove any remaining test article.

All animals were observed for mortality and abnormal clinical signs frequently after dosing on day 0. Thereafter, observations for mortality and abnormal signs were done at least once daily. Body weights were recorded prior to test article application on day 0, and on days 3, 7, 10, and prior to sacrifice on day 14, or at the time found dead.

On day 14, all surviving animals were rendered unconscious by administration of injections of a barbiturate and exsanguinated prior to necropsy; those that succumbed were necropsied as soon as possible after death was noted. The following of each animal were examined and all abnormal findings were recorded: all external surfaces and orifices, and

+Litchfield, J. T., Jr., and Wilcoxon, F., "A Simplified Method of Evaluating Dose-Effect Experiments", Journal of Pharmacology and Experimental Therapeutics, Vol. 96, 1949, pages 99-113.

abdominal, thoracic, and pelvic cavities and their viscera. Necropsies were conducted under the supervision of a pathologist. The treated skin and corresponding untreated control skin was saved for histopathological examination. No other tissues were saved.

Histopathological examination was performed on animals that had succumbed during the test period, and on 2 animals per sex necropsied at the end of the test period. Examinations included skin from the treated and corresponding untreated sites.

The mean, standard deviation, and standard error were calculated for the body weight data and for the amount of test article applied. The approximate amount of test article applied per unit of skin exposed was calculated in milligrams per square centimeters of skin.

RESULTS

A. Primary Dermal Irritation Studies

Brass Powder

Individual body weights and dermal reaction scores recorded during the study are given in Table 1.

Animal number BB8919 exhibited lethargy and bluish skin after test article application on day 0, labored breathing on days 0 and 1, and was found dead on the morning of day 4. Necropsy examination of BB8919 revealed: lungs with scattered areas of atelectasis; a heart with a greatly distended right atrium and incompetent right AV valve; and a small, firm liver with a cobblestone surface. The animal's death was considered to be due to a defective heart and unrelated to the test article.

Erythema and edema (grades 1 through 3), as well as gold/black stained test sites, were observed during the study. All dermal irritation had subsided by the day 5 evaluation. The calculated Primary Irritation Score was 2.0; the test article was considered to be mildly irritating.

Fog Oil

Individual body weights and dermal reaction scores recorded during the study are given in Table 2.

No mortalities were observed during the study. Animal number BB8870 was limping on day 3 of the study. No other abnormal clinical signs were observed during the study.

Erythema (grades 1 through 3), edema (grades 1 through 4), and desquamation were observed during the study. All dermal irritation had subsided by the day 6 evaluation. The calculated Primary Irritation Score was 3.8; the test article was considered to be moderately irritating.

Diesel Fuel

Individual body weights and dermal reaction scores recorded during the study are given in Table 3.

No mortalities or abnormal clinical signs were observed during the study.

Erythema (grades 1 through 4), edema (grades 1 through 3), and desquamation were noted for all animals during the study. Eschar formation was observed for 4 of the animals. One animal's skin peeled off during removal of the test article. All dermal irritation had subsided by the day 10 evaluation. The calculated Primary Irritation Score was 4.0; the test article was considered to be moderately irritating.

0.75 parts Fog Oil:1 part Brass Powder

Individual body weights and dermal reaction scores recorded during the study are given in Table 4.

No mortalities or abnormal clinical signs were observed during the study.

Erythema and edema (grades 1 through 4) were noted for all animals during the study as well as gold/black colored test sites. Blanching and eschar formation were observed for 3

animals, and desquamation was observed for 4 animals. All dermal irritation had susided by the day 9 evaluation. The calculated Primary Irritation Score was 5.6; the test article was considered to be severely irritating.

Ø.7 parts Diesel Fuel:1 part Brass Powder

Individual body weights and dermal reaction scores recorded during the study are given in Table 5.

No mortalities or abnormal clinical signs were observed during the study.

Erythema and edema (grades 1 through 4) were observed for all animals during the study as well as gold/black colored test sites. All animals' skin peeled off from 2 or more test sites during test article removal. Eschar formation, fissures, desquamation, open raw area, and denuded areas were noted for 1 or more animals during the study. All dermal irritation had subsided by the day 14 evaluation. The calculated Primary Irritation Score was 7.7; the test article was considered to be severely irritating.

B. Primary Eye Irritation Studies

Brass Powder

Individual body weights and ocular reaction scores recorded during the study are given in Table 6.

No mortalities or abnormal clinical signs were observed during the study.

Redness (grades 1 through 3), chemosis (grades 1 through 4), discharge (grades 1 and 2), and iritis (grade 1) were observed during the study. Blistering of the conjunctivae was noted for all animals. Two of the animals also exhibited opacities and positive fluorescein staining, and pannus was noted for 1 of these animals. All ocular irritation had subsided by the day 14 evaluation.

All animals were considered to have exhibited a positive response to the test article.

Fog Oil

Individual body weights and ocular reaction scores recorded during the study are given in Table 7.

No mortalities or abnormal clinical signs were observed during the study.

No ocular irritation was observed during the study.

All animals were considered to have exhibited a negative response to the test article.

Diesel Fuel

Individual body weights and ocular reaction scores recorded during the study are given in Table 8.

No mortalities or abnormal clinical signs were observed during the study.

No ocular irritation was observed during the study.

All animals were considered to have exhibited a negative response to the test article.

Ø.75 parts Fog Oil:1 part Brass Powder

Individual body weights and ocular reaction scores recorded during the study are given in Table 9.

No mortalities or abnormal clinical signs were observed during the study.

Redness (grade 1) and chemosis (grade 1) were observed during the study. All ocular irritation had subsided by the 48 hour evaluation interval.

All animals were considered to have exhibited a negative response to the test article.

Ø.7 parts Diesel Fuel:1 part Brass Powder

Individual body weights and ocular reaction scores recorded during the study are given in Table 1Ø.

No mortalities or abnormal clinical signs were observed during the study.

No ocular irritation was noted during the study.

All animals were considered to have exhibited a negative response to the test article.

C. Acute Dermal Toxicity Studies

Brass Powder

Individual data (body weight, test article administration, antemortem observations, and necropsy findings) are presented in Tables 11, 12 and 13. Histopathology results are given in Appendix D.

All animals survived the 14 day observation period of the study and gained overall body weight over 14 days, but there was a decrease in body weight on day 3. Observations noted during the study included: erythema, edema, and desquamation at the treated skin; treated skins and surrounding fur stained gold/black; few stools; food appeared undisturbed; and eye discharge.

Necropsy examinations of all animals revealed 2 animals with abnormal findings. One animal exhibited diffuse, dark green discoloration of the treated skin, and another animal had diffuse, pale discoloration of the kidneys.

The dermal LD5Ø of the test article was considered to be greater than 2 grams per kilogram of body weight.

Fog Oil

Individual data (body weight, test article administration, antemortem observations, and necropsy findings) are presented in Tables 14, 15, and 16. Histopathology results are given in Appendix D.

All animals survived the 14 day observation period of the study and gained overall body weight. Observations noted during the study included: erythema, edema, and desquamation at the treated skin; eye discharge; crusty eyes; and vocalization.

Necropsy examinations of all animals revealed 4 animals with abnormal findings. Three animals exhibited multiple focal, red discoloration of the treated skin, and 1 of these animals also had crusty material around the eyes. One animal had fur which was slightly crusted on the treated skin.

The dermal LD50 of the test article was considered to be greater than 2 grams per kilogram of body weight.

Diesel Fuel

Individual data (body weight, test article administration, antemortem observations, and necropsy findings) are presented in Tables 17, 18 and 19.

All but 1 animal survived the 14 day observation period of the study. No significant body weight losses were noted. Observations noted during the study included: erythema, edema, desquamation, atonia, eschar formation, fissures, denuded area and red discharge at the treated skin; few stools; no stool; food appears undisturbed; loose stools; foamy loose stools; and death.

Necropsy examination of the animal found dead revealed: mild thickening, crusted tan discoloration, and abscess of the treated skin; dried fecal material in the perianal region; a stomach distended with gas and fluid; multiple, focal, black discolorations on the stomach mucosa; a cecum distended with gas; and intestine with mucoid and fluid contents. This animal's death was considered to be due to mucoid enteropathy and unrelated to the test article.

Necropsy examinations of the surviving animals revealed: thickened, crusted, and scabbed treated skin; stomachs and intestine with fluid contents; a colon with mucoid contents; multiple, focal, red discolorations of lungs; and fecal material on the lower abdominal and periaral regions.

The dermal LD50 of the test article was considered to be greater than 2 grams per kilogram of body weight.

0.75 parts Fog Oil:1 part Brass Powder

Individual data (body weight, test article administration, antemortem observations and necropsy findings) are presented in Tables 20, 21 and 22. Histopathology results are given in Appendix D.

All animals survived the 14 day observation period of the study and gained overall body weight. Observations noted during the study included: erythema, edema, desquamation and gold discoloration of the treated skin.

Necropsy examinations of all animals revealed: faint, dark green discoloration, mild thickening, and tan crusting of treated skin; diffuse pale discoloration of kidneys; a missing kidney; and an enlarged kidney.

The dermal LD50 of the test article was considered to be greater than 2 grams per kilogram of body weight.

0.7 parts Diesel Fuel:1 part Brass Powder

Individual data (body weight, test article administration, antemortem observations and necropsy findings) are presented in Tables 23, 24 and 25.

All animals survived the 14 day observation period of the study. No significant body weight losses were noted. Observations noted during the study included: gold discoloration, erythema, edema, skin peeling off, eschar formation, atonia, desquamation, red discharge, and denuded areas

at the treated skin; few stools; undisturbed food; and moist rales.

Necropsy examinations of all animals revealed: red discoloration, thickening, tan and/or dark green crusting, and thin hair coat at the treated skin; red discoloration of a lung; and pale discoloration of a kidney.

The dermal LD50 of the test article was considered to be greater than 2 grams per kilogram of body weight.

D. Acute Oral Toxicity Studies

Brass Powder

The individual data (body weight, test article administration, antemortem observations and necropsy findings) are presented in Tables 26, 27 and 28.

One male survived the 14-day observation period of the study. All other animals died (as early as day 2 and as late as day 6). Observations noted during the study included: gold colored, dark colored and loose stools; red colored stains on the cage board; lethargy; ataxia; squinting; damp and yellow/brown stained fur in the perianal region; crusty eyes and muzzles; base of tail and part of scrotum scabby; and death.

Necropsy examinations of the animals found dead revealed: a stomach and intestines distended with fluid; non-glandular stomachs with gold material adhered to the mucosa or discolored gold; multiple, focal brown discolorations on the mucosa of a glandular stomach; intestines with green, dark green, or dark contents; intestine with fluid contents; lungs with pale discoloration; a pale liver; green staining on the tail, perianal region, and perineum; green staining around the nose and mouth; and red discoloration of the skin on the base of the tail.

Necropsy examination of the surviving animal revealed scabbed skin on the base of the tail and in the perianal region.

Note: See section (Oral LD50 Studies) of this report.

Fog Oil

The individual data (body weight, test article administration, antemortem observations and necropsy findings) are presented in Tables 29, 30 and 31.

All animals survived the 14-day observation period of the study and gained overall body weight. Observations noted during the study were damp and yellow/brown stained fur in the perianal region and crusty eyes.

Necropsy examinations of all animals revealed 1 female with a clear cyst on the left ovary. This finding was not considered to be test article-related.

The oral LD50 of the test article was considered to be greater than 5 grams per kilogram of body weight.

Diesel Fuel

The individual data (body weight, test article administration, antemortem observations and necropsy findings) are presented in Tables 32, 33 and 34.

All animals survived the 14 day observation period of the

study and gained overall body weight. Observations noted during the study included: squinting, lethargy, lacrimation, crusty nose, and damp and yellow/brown stained fur in the perianal region.

Necropsy examinations of all animals revealed 3 animals with abnormalities. Two females had an ovarian cyst, and 1 of these females also had multiple focal, red discoloration of the right diaphragmatic and left lung lobes. One male exhibited diffuse, red discoloration of the lung. These findings were not considered to be test article-related.

The oral LD50 of the test article was considered to be greater than 5 grams per kilogram of body weight.

0.75 parts Fog Oil:1 part Brass Powder

The individual data (body weight, test article administration, antemortem observations, and necropsy findings) are presented in Tables 35, 36 and 37.

All animals survived the 14 day observation period of the study and gained overall body weight. One animal was squinting on the day of dosing. There were no other abnormal observations.

Necropsy examinations of all animals revealed no abnormal findings.

The oral LD50 of the test article was considered to be greater than 5 grams per kilogram.

0.7 parts Diesel Fuel:1 part Brass Powder

The individual data (body weight, test article administration, antemortem observations, and necropsy findings) are presented in Tables 38, 39 and 40.

All animals survived the 14 day observation period of the study and gained overall body weight. Observations noted during the study included: lethargy, lacrimation, squinting, loose stool, crusty muzzle, and yellow/brown stained fur in the perianal region.

Necropsy examinations of all animals revealed no abnormal findings.

The oral LD50 of the test article was considered to be greater than 5 grams per kilogram of body weight.

E. Oral LD50 Study

Brass Powder

The individual data (body weight and test article administration, antemortem observations, and necropsy findings) are presented in Tables 41, 42 and 43. Tables 44 through 46 present the results of the Litchfield-Wilcoxon LD50 determinations. Figures E-1, E-2, and E-3 depict the dose-response curves.

The oral LD50 of Brass Powder was determined to be 1586.9 mg/kg for males, 1696.1 mg/kg for females, and 1561.2 mg/kg for the combined sexes. The incidences of death were as follows:

Group (mg/kg)	Number Dead/Number Tested Males	Females
891	0/5	0/5
1,413	3/5	2/5
2,239	4/5	5/5
3,548	4/5	4/5

All deaths occurred within 2 to 6 days after dosing.

Observations noted during the study included: gold or dark colored stools, loose stool, few or no stools, lethargy, ataxia, pale, lacrimation, squinting, emaciation or thinness, crusty nose, eyes, or muzzle, poor coat quality, piloerection, damp or yellow/brown stained fur in the perianal region, base of tail and/or scrotum scabby, red area at base of tail, tip of tail dark, and death.

Necropsy examinations of the animals found dead revealed: gastro-intestinal tracts with dark, dark green, or green/gold contents; a stomach distended with green metallic flakes; mucosa of non-glandular stomachs coated with gold material; glandular stomachs with smooth mucosa; red or brown discoloration of gastro-intestinal tracts; hyperemia of the small intestine and colon; pale discoloration of the liver; bilateral, pale red discoloration of the adrenal; red discoloration of skin at the base of the tail; goldish-dark, dark green, or green staining of the perianal region; and red/brown crusted material in the nose and mouth area.

Necropsy examinations of the surviving animals revealed two 1,413 mg/kg males with the base of the tail scabbed and/or ulcerated, and one 3,548 mg/kg male with dark green kidneys, a crusted ulceration at the base of the tail, and a black tail tip.

TABLE 1: INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: BRASS POWDER

Animal Number	Sex	Initial Body Weight (kg)	24 (±2) Hours** Intact Sites Right Side ER	ED	Left Side ER	ED	Abraded Sites Right Side ER	ED	Left Side ER	ED	72 (±2) Hours** Intact Sites Right Side ER	ED	Left Side ER	ED	Abraded Sites Right Side ER	ED	Left Side ER	ED
BB8865	M	2.26	1+	0	1+	0	2+	2	1+	2	0	0	0	0	0+	0	0+	0
BB8866	M	2.76	2+	2	2+	2	2+	2	2+	2	0+	0	0+	0	0+	0	0+	0
BB8867	M	2.56	3+	2	3+	3	2+	2	3+	3	1+	0	1+	0	1+	0	1+	1
BB8918	F	2.40	1+	0	2+	0	1+	2	2+	2	0+	0	0+	0	0+	0	0+	0
BB8919	F	2.00	1+	0	1+	0	1+	2	1+	1	0	0	0+	0	1+	1	1	0
BB8920	F	2.42	3+	3	1+	2	2+	3	3+	3	1+	0	0+	0	1+	0	1+	1
Total =			11	7	10	7	10	13	12	13	2	0	1	0	3	1	3	2
Average =			(A) 1.8	(B) 1.2	(C) 1.7	(D) 1.2	(E) 1.7	(F) 2.2	(G) 2.0	(H) 2.2	(I) 0.3	(J) 0.0	(K) 0.2	(L) 0.0	(M) 0.5	(N) 0.2	(O) 0.5	(P) 0.3

** = After test article application
ER = Erythema
ED = Edema
+ = Test site stained gold/black by the test article.

$$\text{Primary Irritation Score} = \frac{A + B + C + D + E + F + G + H + I + J + K + L + M + N + O + P}{8} = 2.0$$

TABLE 1 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: BRASS POWDER

Animal Number	Day 4**								Day 5**							
	Intact Sites				Abraded Sites				Intact Sites				Abraded Sites			
	Right Side		Left Side		Right Side		Left Side		Right Side		Left Side		Right Side		Left Side	
	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED
BB8865	0	0	0	0	0	0	0+	0	0	0	0	0	0	0	0+	0
BB8866	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BB8867	0+	0	0+	0	0+	0	1+	0	0+	0	0+	0	0+	0	0+	0
BB8918	0+	0	0+	0	0+	0	0+	0	0+	0	0+	0	0+	0	0+	0
BB8919	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BB8920	0+	0	0+	0	0+	0	0+	0	0+	0	0+	0	0+	0	0+	0

** = After test article application
ER = Erythema
ED = Edema
+ = Test site stained gold/black by the test article.
- = Not evaluated. BB8919 was found dead on the morning of day 4.

TABLE 2: INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: FOG OIL

Animal Number	Sex	Initial Body Weight (kg)	24 (±2) Hours** Intact Sites Right ER	Intact Sites Right Side ED	Intact Sites Left ER	Intact Sites Left Side ED	Abraded Sites Right ER	Abraded Sites Right Side ED	Abraded Sites Left ER	Abraded Sites Left Side ED	72 (±2) Hours** Intact Sites Right ER	Intact Sites Right Side ED	Intact Sites Left ER	Intact Sites Left Side ED	Abraded Sites Right ER	Abraded Sites Right Side ED	Abraded Sites Left ER	Abraded Sites Left Side ED
BB8868	M	2.40	2	2	2	4	2	2	2	3	0	0	0	0	1	0	1	0
BB8869	M	2.08	3	4	3	4	3	4	3	4	1	0	1	0	1	0	1	0
BB8870	M	2.56	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
BB8921	F	2.00	2	4	3	4	2	4	3	4	2	0	2	0	2	1	2	1
BB8922	F	2.16	2	4	2	4	2	4	2	4	2	0	2	0	2	0	2	0
BB8923	F	2.32	2	3	2	4	2	3	2	3	1	0	2	0	1	0	2	0
Total =			13	19	14	22	13	19	14	20	8	2	9	2	9	3	10	3
Average =			(A) 2.2	(B) 3.2	(C) 2.3	(D) 3.7	(E) 2.2	(F) 3.2	(G) 2.3	(H) 3.3	(I) 1.3	(J) 0.3	(K) 1.5	(L) 0.3	(M) 1.5	(N) 0.5	(O) 1.7	(P) 0.5

** = After test article application
ER = Erythema
ED = Edema

$$\text{Primary Irritation Score} = \frac{A + B + C + D + E + F + G + H + I + J + K + L + M + N + O + P}{8} = 3.8$$

TABLE 2 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: FOG OIL

Animal Number	Day 4**								Day 5**							
	Intact Sites				Abraded Sites				Intact Sites				Abraded Sites			
	Right Side		Left Side		Right Side		Left Side		Right Side		Left Side		Right Side		Left Side	
	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED
BB8868	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BB8869	0	0	0[d]	0	0	0	0[d]	0	0	0	0[d]	0	0	0	0[d]	0
BB8870	1	0	1	1	1	1	1	1	0	0	1	0	1	1	1	0
BB8921	1	0	1[d]	0	1	0	1[d]	0	1	0	1[d]	0	1	0	1[d]	0
BB8922	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0
BB8923	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation

TABLE 2 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: FOG OIL

	Day 6**							
	Intact Sites				Abraded Sites			
Animal Number	Right ER	Side ED	Left ER	Side ED	Right ER	Side ED	Left ER	Sid ED
BB8868	Ø	Ø	Ø	Ø	Ø	Ø	Ø[d]	
BB8869	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	
BB8870	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	
BB8921	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	
BB8922	Ø	Ø	Ø	Ø	Ø	Ø	Ø	
BB8923	Ø	Ø	Ø	Ø	Ø	Ø	Ø	

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation

TABLE 3: INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: DIESEL FUEL

Animal Number	Sex	Initial Body Weight (kg)	24 (±2) Hours**								72 (±2) Hours**							
			Intact Sites				Abraded Sites				Intact Sites				Abraded Sites			
			Right Side		Left Side		Right Side		Left Side		Right Side		Left Side		Right Side		Left Side	
			ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED
BB8795	M	2.38	1	2	1	2	2	2	2	2	0	0	2[d]	2	1[d]	1	2[d]	2
BB8796	M	2.18	2	2	2	2	2	2	2	2	1[d]	1	1[d]	1	1[d]	1	1[d]	1
BB8797	M	2.36	4+	2	4+	2	3	2	2	2	4[e]	3	4[e]	2	4[e]	3	4[e]	3
BB8909	F	2.52	2	2	2	2	3	2	2	2	1	0	4[e]	3	2	1	2[d]	1
BB8910	F	2.06	2	2	2	3	2	2	2	3	1	1	1	2	3	2	2[d]	2
BB8911	F	2.30	1	2	2	3	2	3	2	3	2	1	2	1	3	2	1	1
Total =			12	12	13	14	14	13	12	14	9	6	14	11	14	10	12	10
Average =			(A) 2.0	(B) 2.0	(C) 2.2	(D) 2.3	(E) 2.3	(F) 2.2	(G) 2.0	(H) 2.3	(I) 1.5	(J) 1.0	(K) 2.3	(L) 1.8	(M) 2.3	(N) 1.7	(O) 2.0	(P) 1.7

** = After test article application
ER = Erythema
ED = Edema
+ = Skin peeled off while removing test article.
d = Desquamation
e = Eschar formation

$$\text{Primary Irritation Score} = \frac{A + B + C + D + E + F + G + H + I + J + K + L + M + N + O + P}{8} = 4.0$$

TABLE 3 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: DIESEL FUEL

Animal Number	Day 4**								Day 5**							
	Intact Sites				Abraded Sites				Intact Sites				Abraded Sites			
	Right Side		Left Side		Right Side		Left Side		Right Side		Left Side		Right Side		Left Side	
	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED
BB8795	0[d]	0	2[d]	2	1[d]	1	2[d]	2	0[d]	0	2[d]	2	1[d]	1	2[d]	2
BB8796	1[d]	1	1[d]	1	1[d]	1	1[d]	1	1[d]	1	1[d]	1	1[d]	1	1[d]	1
BB8797	4[e]	3	4[e]	2	4[e]	3	4[e]	2	4[ed]	2	4[ed]	2	4[ed]	2	2[d]	1
BB8909	1[d]	0	4[e]	3	2[d]	1	2[d]	1	1[d]	0	4[ed]	3	2[d]	1	2[d]	1
BB8910	1[d]	1	1[d]	2	3[d]	2	2[d]	2	1[d]	0	1[d]	1	3[d]	2	1[d]	1
BB8911	2[d]	1	2[d]	1	4[ed]	2	1[d]	1	1[d]	1	1[d]	1	4[ed]	2	1[d]	1

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation
e = Eschar formation

TABLE 3 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: DIESEL FUEL

Animal Number	Day 6**								Day 7**							
	Intact Sites				Abraded Sites				Intact Sites				Abraded Sites			
	Right Side		Left Side		Right Side		Left Side		Right Side		Left Side		Right Side		Left Side	
	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED
BB8795	0[d]	0	1[d]	1	0[d]	0	1[d]	1	0[d]	0	0[d]	0	0[d]	0	0[d]	0
BB8796	0[d]	0	1[d]	1	1[d]	1	0[d]	0	0[d]	0	0[d]	0	0[d]	0	0[d]	0
BB8797	4[ed]	2	4[ed]	2	3[d]	2	2[d]	1	2[d]	2	4[ed]	2	1[d]	1	2[d]	1
BB8909	1[d]	0	4[ed]	3	1[d]	1	1[d]	1	0[d]	0	4[ed]	3	0[d]	0	0[d]	0
BB8910	0[d]	0	0[d]	0	4[ed]	2	1[d]	1	0[d]	0	0[d]	0	4[ed]	2	1[d]	1
BB8911	1[d]	0	1[d]	0	4[ed]	2	1[d]	0	1[d]	0	0[d]	0	4[ed]	1	0[d]	0

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation
e = Eschar formation

TABLE 3 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: DIESEL FUEL

Animal Number	Day 8**								Day 9**							
	Intact Sites				Abraded Sites				Intact Sites				Abraded Sites			
	Right Side		Left Side		Right Side		Left Side		Right Side		Left Side		Right Side		Left Side	
	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED
BB8795	0[d]	0	0[d]	0	0[d]	0	0[d]	0	0[d]	0	0[d]	0	0[d]	0	0[d]	0
BB8796	0[d]	0	0[d]	0	0[d]	0	0[d]	0	0[d]	0	0[d]	0	0[d]	0	0[d]	0
BB8797	1[d]	1	3[d]	1	0[d]	1	1[d]	1	0[d]	0	1[d]	0	0[d]	0	0[d]	0
BB8909	0[d]	0	2[d]	1	0[d]	0	0[d]	0	0[d]	0	0[d]	0	0[d]	0	0[d]	0
BB8910	0[d]	0	0[d]	0	2[d]	1	0[d]	0	0[d]	0	0[d]	0	0[d]	0	0[d]	0
BB8911	0[d]	0	0[d]	0	2[d]	1	0[d]	0	0[d]	0	0[d]	0	1[d]	1	0[d]	0

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation

TABLE 3 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: DIESEL FUEL

	Day 10**							
	Intact Sites				Abraded Sites			
Animal Number	Right Side ER	ED	Left Side ER	ED	Right Side ER	ED	Left Side ER	ED
BB8795	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	
BB8796	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	
BB8797	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	
BB8909	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	
BB8910	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	
BB8911	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	Ø	Ø[d]	

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation

TABLE 4: INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: 0.75 PARTS FOG OIL: 1 PART BRASS POWDER

Animal Number	Sex	Initial Body Weight (kg)	24 (±2) Hours** Intact Sites Right Side ER	ED	Left Side ER	ED	Abraded Sites Right Side ER	ED	Left Side ER	ED	72 (±2) Hours** Intact Sites Right Side ER	ED	Left Side ER	ED	Abraded Sites Right Side ER	ED	Left Side ER	ED
BB8798	M	2.42	2+	2	3+	2	3+	2	2+	2	1+	0	1+	0	1+	0	1+	0
BB8799	M	2.34	3+	4	3+	4	3+	4	4+	4	2+	1	2+	1	2+	1	3+	2
BB8800	M	2.00	4[b]+	4	4[b]+	4	4[b]+	4	4[b]+	4	4[e]+	2	3+	3	4[e]+	2	4[e]+	2
BB8912	F	2.10	4[b]+	4	4[b]+	4	4[b]+	4	4[b]+	4	3+	2	4[e]+	2	4[e]+	3	4[e]+	4
BB8913	F	2.32	4+	2	3+	3	4+	4	3+	2	2+	1	2+	1	2+	1	2+	2
BB8914	F	2.18	4+	4	3+	4	4[b]+	4	4[b]+	4	2+	1	2+	1	4[e]+	3	4[e]+	2
Total =			21	20	20	21	22	22	21	20	14	7	14	8	17	10	18	12
Average =			(A) 3.5	(B) 3.3	(C) 3.3	(D) 3.5	(E) 3.7	(F) 3.7	(G) 3.5	(H) 3.3	(I) 2.3	(J) 1.2	(K) 2.3	(L) 1.3	(M) 2.8	(N) 1.7	(O) 3.0	(P) 2.0

** = After test article application
ER = Erythema
ED = Edema
\+ = Test site discolored gold/black.
b = Blanching

Primary Irritation Score = $\frac{A + B + C + D + E + F + G + H + I + J + K + L + M + N + O + P}{8} = 5.6$

TABLE 4 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: 0.75 PARTS FOG OIL: 1 PART BRASS POWDER

Animal Number	Day 4**								Day 5**							
	Intact Sites				Abraded Sites				Intact Sites				Abraded Sites			
	Right Side		Left Side		Right Side		Left Side		Right Side		Left Side		Right Side		Left Side	
	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED
BB8798	0+	0	0	0	0	0	0	0	0+	0	0	0	0	0	0	0
BB8799	1	0	1	0	1	0	2	1	0	0	0	0	0	0	1	0
BB8800	4[e]	2	1[d]	1	1[d]	1	4[e]	2	2[d]	1	1[d]	0	1[d]	0	2[d]	1
BB8912	1[d]	1	1[d]	0	2[d]	1	4[e]	2	1[d]	0	1[d]	0	1[d]	1	2[d]	1
BB8913	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0
BB8914	1+	0	1+	0	4[e]	2	2[d]	1	0+	0	0+	0	2[d]	1	1[d]	0

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation
e = Eschar formation
+ = Test site discolored gold.

TABLE 4 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: 0.75 PARTS FOG OIL: 1 PART BRASS POWDER

Animal Number	Day 6**								Day 7**							
	Intact Sites				Abraded Sites				Intact Sites				Abraded Sites			
	Right Side		Left Side		Right Side		Left Side		Right Side		Left Side		Right Side		Left Side	
	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED
BB8798	0+	0	0	0	0	0	0	0	0+	0	0	0	0	0	0	0
BB8799	0+	0	0+	0	0+	0	$1^{d}+$	0	0+	0	0+	0	0+	0	$0^{d}+$	0
BB8800	1^{d}	1	0^{d}	0	1^{d}	0	1^{d}	1	1^{d}	1	0^{d}	0	0^{d}	0	1^{d}	0
BB8912	$1^{d}+$	0	$0^{d}+$	0	$1^{d}+$	1	$2^{d}+$	1	$0^{d}+$	0	$0^{d}+$	0	$0^{d}+$	0	$1^{d}+$	1
BB8913	0+	0	0+	0	0+	0	0+	0	0+	0	0+	0	0+	0	0+	0
BB8914	0+	0	0+	0	$1^{d}+$	1	$1^{d}+$	0	0+	0	0+	0	$0^{d}+$	0	$0^{d}+$	0

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation
+ = Test site discolored gold/black.

TABLE 4 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: 0.75 PARTS FOG OIL: 1 PART BRASS POWDER

Animal Number	Day 8**								Day 9**							
	Intact Sites				Abraded Sites				Intact Sites				Abraded Sites			
	Right Side		Left Side		Right Side		Left Side		Right Side		Left Side		Right Side		Left Side	
	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED
BB8798	0+	0	0	0	0	0	0	0	0+	0	0	0	0	0	0	0
BB8799	0+	0	0+	0	0+	0	0^{d}+	0	0+	0	0+	0	0+	0	0^{d}+	0
BB8800	1^{d}	0	0^{d}	0	0^{d}	0	0^{d}	0	0^{d}	0	0^{d}	0	0^{d}	0	0^{d}	0
BB8912	0^{d}+	0	0^{d}+	0	0^{d}+	0	1^{d}+	0	0^{d}+	0	0^{d}+	0	0^{d}+	0	0^{d}+	0
BB8913	0+	0	0+	0	0+	0	0+	0	0+	0	0+	0	0+	0	0+	0
BB8914	0+	0	0+	0	0^{d}+	0	0^{d}+	0	0+	0	0+	0	0^{d}+	0	0^{d}+	0

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation
+ = Test site discolored gold/black.

TABLE 5: INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: 0.7 PARTS DIESEL FUEL: 1 PART BRASS POWDER

Animal Number	Sex	Initial Body Weight (kg)	24 (±2) Hours** Intact Sites Right Side ER	ED	Left Side ER	ED	Abraded Sites Right Side ER	ED	Left Side ER	ED	72 (±2) Hours** Intact Sites Right Side ER	ED	Left Side ER	ED	Abraded Sites Right Side ER	ED	Left Side ER	ED
BB8862	M	2.56	2+	3	$4^{s}+$	4	$4^{s}+$	4	2+	3	2+	1	4^{eo}	4	$4^{e}+$	3	3+	2
BB8863	M	2.52	$4^{s}+$	4	$4^{s}+$	4	4+	4	$4^{s}+$	4	$4^{e}+$	4	$4^{e}+$	4	$4^{e}+$	4	$4^{e}+$	4
BB8864	M	2.66	$4^{s}+$	4	$4^{s}+$	4	$4^{s}+$	4	$4^{s}+$	4	$4^{e}+$	4	$4^{ef}+$	4	$4^{e}+$	4	$4^{ef}+$	4
BB8915	F	2.16	$4^{s}+$	4	$4^{s}+$	4	$4^{s}+$	4	$4^{s}+$	4	$4^{e}+$	4	$4^{e}+$	4	$4^{e}+$	4	$4^{e}+$	4
BB8916	F	2.34	$4^{s}+$	4	$4^{s}+$	4	$4^{s}+$	4	$4^{s}+$	4	$4^{e}+$	4	$4^{e}+$	4	$4^{e}+$	4	$4^{e}+$	4
BB8917	F	2.14	$4^{s}+$	4	$4^{s}+$	4	$4^{s}+$	4	$4^{s}+$	4	$4^{e}+$	4	$4^{e}+$	4	$4^{e}+$	4	$4^{e}+$	4
Total =			22	23	24	24	24	24	22	23	22	21	24	24	24	23	23	22
Average =			(A) 3.7	(B) 3.8	(C) 4.0	(D) 4.0	(E) 4.0	(F) 4.0	(G) 3.7	(H) 3.8	(I) 3.7	(J) 3.5	(K) 4.0	(L) 4.0	(M) 4.0	(N) 3.8	(O) 3.8	(P) 3.7

** = After test article application
ER = Erythema
ED = Edema
+ = Test site stained gold/black by the test article.
s = Skin peeled off while removing test article.
e = Eschar formation
o = Open, raw area extending below test site.
f = Fissures

$$\text{Primary Irritation Score} = \frac{A + B + C + D + E + F + G + H + I + J + K + L + M + N + O + P}{8} = 7.7$$

TABLE 5 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: 0.7 PARTS DIESEL FUEL: 1 PART BRASS POWDER

Animal Number	Day 4**								Day 5**							
	Intact Sites				Abraded Sites				Intact Sites				Abraded Sites			
	Right Side		Left Side		Right Side		Left Side		Right Side		Left Side		Right Side		Left Side	
	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED
BB8862	1[d]	0	4[eo]	4	4[ed]	2	2	1	0[d]	0	4[ed]	4	4[ed]	2	1[d]	1
BB8863	4[e]	4	4[e]	3	4[e]	4	4[e]	3	4[e]	4	4[e]	3	4[e]	4	4[e]	3
BB8864	4[e]	3	4[ed]	4	4[e]	3	4[ed]	4	4[e]	3	4[ed]	4	4[e]	3	4[ed]	4
BB8915	4[e]	4	4[e]	4	4[e]	4	4[e]	4	4[e]	4	4[e]	4	4[e]	4	4[e]	4
BB8916	4[e]	4	4[e]	4	4[e]	4	4[e]	4	4[e]	4	4[e]	4	4[e]	4	4[e]	4
BB8917	4[e]	4	4[e]	4	4[e]	4	4[e]	4	4[e]	4	4[e]	4	4[e]	4	4[e]	4

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation
e = Eschar formation
o = Open, raw area extending below test site

TABLE 5 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: 0.7 PARTS DIESEL FUEL: 1 PART BRASS POWDER

Animal Number	Day 6**								Day 7**							
	Intact Sites				Abraded Sites				Intact Sites				Abraded Sites			
	Right Side		Left Side		Right Side		Left Side		Right Side		Left Side		Right Side		Left Side	
	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED
BB8862	0[d]	0	4[ed]	3	4[ed]	2	0[d]	0	0[d]	0	4[ed]	2	3[d]	2	0[d]	0
BB8863	4[ed]	4	4[ed]	3	4[ed]	4	4[ed]	3	4[ed]	3	4[ed]	3	4[ed]	3	4[ed]	3
BB8864	4[ed]	3	4[ed]	3	4[ed]	3	4[ed]	4	4[ed]	3	4[ed]	3	4[ed]	3	4[ed]	3
BB8915	4[ed]	3	4[ed]	4	4[ed]	3	4[ed]	3	3[d]	2	4[ed]	4	4[ed]	2	4[ed]	3
BB8916	4[ed]	2	4[ed]	3	4[ed]	3	4[ed]	4	4[ed]	2	2[d]	1	4[ed]	2	4[ed]	3
BB8917	4[ed]	4	4[ed]	4	4[ed]	4	4[ed]	4	4[ed]	2	4[ed]	3	4[ed]	3	4[ed]	3

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation
e = Eschar formation

TABLE 5 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: 0.7 PARTS DIESEL FUEL: 1 PART BRASS POWDER

Animal Number	Day 8** Intact Sites Right Side ER	ED	Left Side ER	ED	Abraded Sites Right Side ER	ED	Left Side ER	ED	Day 9** Intact Sites Right Side ER	ED	Left Side ER	ED	Abraded Sites Right Side ER	ED	Left Side ER	ED
BB8862	0	0	3[d]	1	2[d]	1	0[d]	0	0	0	0[d]	0	1[d]	0	0[d]	0
BB8863	4[ed]	3	4[ed]	2	4[ed]	3	4[ed]	2	4[ed]	2	4[ed]	2	4[ed]	3	4[ed]	2
BB8864	2[dn]	1	4[edn]	1	2[dn]	1	4[edn]	2	0[dn]	0	2[dn]	1	1[dn]	0	2[dn]	1
BB8915	3[d]	2	4[ed]	3	4[ed]	2	4[ed]	2	2[d]	1	3[d]	2	4[ed]	2	2[dn]	1
BB8916	4[ed]	1	0[d]	0	4[ed]	1	4[ed]	1	2[d]	1	0[d]	0	2[d]	1	2[d]	1
BB8917	4[ed]	1	4[ed]	2	4[ed]	3	4[ed]	3	4[ed]	1	4[ed]	2	4[ed]	3	4[ed]	2

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation
e = Eschar formation
n = Denuded area

TABLE 5 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: 0.7 PARTS DIESEL FUEL: 1 PART BRASS POWDER

Animal Number	Day 10**								Day 11**							
	Intact Sites				Abraded Sites				Intact Sites				Abraded Sites			
	Right Side		Left Side		Right Side		Left Side		Right Side		Left Side		Right Side		Left Side	
	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED
BB8862	0	0	0^{d}	0	0^{d}	0	0^{d}	0	0	0	0^{d}	0	0^{d}	0	0^{d}	0
BB8863	2^{d}	2	4^{ed}	2	4^{ed}	2	4^{ed}	2	2^{d}	2	4^{ed}	2	4^{ed}	2	4^{ed}	2
BB8864	0^{dn}	0	1^{dn}	1	0^{dn}	0	1^{dn}	1	0^{dn}	0	0^{dn}	0	0^{dn}	0	1^{dn}	1
BB8915	1^{d}	1	3^{d}	1	4^{edn}	1	1^{dn}	1	1^{d}	1	2^{d}	1	4^{edn}	1	0^{dn}	0
BB8916	0^{d}	0	0^{d}	0	0^{d}	0	0^{d}	0	0^{d}	0	0^{d}	0	0^{d}	0	0^{d}	0
BB8917	4^{ed}	1	4^{ed}	1	4^{ed}	1	4^{ed}	1	4^{ed}	1	4^{ed}	1	4^{ed}	1	4^{ed}	1

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation
e = Eschar formation
n = Denuded area

TABLE 5 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DATA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: 0.7 PARTS DIESEL FUEL: 1 PART BRASS POWDER

Animal Number	Day 12**								Day 13**							
	Intact Sites				Abraded Sites				Intact Sites				Abraded Sites			
	Right Side		Left Side		Right Side		Left Side		Right Side		Left Side		Right Side		Left Side	
	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED	ER	ED
BB8862	0	0	0^{d}	0	0^{d}	0	0^{d}	0	0	0	0^{d}	0	0^{d}	0	0^{d}	0
BB8863	1^{d}	0	4^{ed}	2	2^{dn}	2	4^{ed}	2	0^{d}	0	1^{dn}	0	1^{dn}	0	2^{dn}	1
BB8864	0^{dn}	0	0^{dn}	0	0^{dn}	0	0^{dn}	0	0^{dn}	0	0^{dn}	0	0^{dn}	0	0^{dn}	0
BB8915	0^{d}	0	1^{d}	0	4^{edn}	1	0^{dn}	0	0^{dn}	0	0^{d}	0	2^{dn}	0	0^{dn}	0
BB8916	0^{d}	0	0^{d}	0	0^{d}	0	0^{d}	0	0^{d}	0	0	0	0^{dn}	0	0^{dn}	0
BB8917	4^{ed}	1	4^{ed}	1	4^{ed}	1	4^{ed}	1	2^{d}	1	2^{d}	1	2^{d}	1	2^{d}	1

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation
e = Eschar formation
n = Denuded area

TABLE 5 (continued): INDIVIDUAL BODY WEIGHT AND DERMAL REACTION DA

PRIMARY DERMAL IRRITATION STUDY IN RABBITS

TEST ARTICLE: 0.7 PARTS DIESEL FUEL: 1 PART BRASS POWDER

	Day 14**							
	Intact Sites				Abraded Sites			
Animal Number	Right Side ER	ED	Left Side ER	ED	Right Side ER	ED	Left Side ER	ED
BB8862	0	0	0[d]	0	0[d]	0	0[d]	0
BB8863	0[d]	0	0[dn]	0	0[dn]	0	0[dn]	0
BB8864	0[dn]	0	0[dn]	0	0[dn]	0	0[dn]	0
BB8915	0[dn]	0	0[d]	0	0[dn]	0	0[dn]	0
BB8916	0[d]	0	0	0	0[dn]	0	0[dn]	0
BB8917	0[d]	0	0[d]	0	0[d]	0	0[d]	0

** = After test article application
ER = Erythema
ED = Edema
d = Desquamation
n = Denuded area

TABLE 6: INDIVIDUAL BODY WEIGHT AND OCULAR REACTION DATA

PRIMARY EYE IRRITATION STUDY IN RABBITS

TEST ARTICLE: BRASS POWDER

Time Interval	Prior to Instillation			24 (±2) Hours			48 (±2) Hours			72 (±2) Hours		
Animal Number	BB 8931	BB 8932	BB 8933	BB 8931	BB 8932	BB 8933	BB 8931	BB 8932	BB 8933	BB 8931	BB 8932	BB 8933
Body Weight (kg)	2.38	2.28	2.32									
I. Cornea												
A. Density	0	0	0	1	2	0	1	2	0	0	1	0
B. Area	0	0	0	1	1	0	1	1	0	0	1	0
A x B x 5	0	0	0	5	10	0	5	10	0	0	5	0
II. Iris												
A. Values	0	0	0	0	1	0	0	1	0	0	0	0
A x 5	0	0	0	0	5	0	0	5	0	0	0	0
III. Conjunctivae												
A. Redness	0	0	0	$3^{+,b}$	$3^{+,b}$	$3^{+,b}$	2	3^{+}	2^{+}	1	2^{+}	1^{+}
B. Chemosis	0	0	0	2	4	2	1	2	1	0	2	0
C. Discharge	0	0	0	2	2	1	0	2	0	0	0	0
(A + B + C) x 2	0	0	0	14	18	12	6	14	6	2	8	2
Total I + II + III	0	0	0	19	33	12	11	29	6	2	13	2
Reaction to Fluorescein**	0	0	0	1	1	0	0	1	0	0	0	0
Mean		0.0			21.3			15.3			5.7	
S.D.		0.0			10.7			12.1			6.4	
S.E.		0.0			6.2			7.0			3.7	

** Any fluorescein stain retention in the eye was considered to be epithelial swelling/erosion and not a true stromal opacity. Values were not included in the totals and means.

+ = Test article stain (black/gold) on right side of face

b = Blistering of the conjunctivae

TABLE 6 (continued): INDIVIDUAL BODY WEIGHT AND OCULAR REACTION DATA

PRIMARY EYE IRRITATION STUDY IN RABBITS

TEST ARTICLE: BRASS POWDER

	Day 7			Day 14		
Animal Number	BB 8931	BB 8932	BB 8933	BB 8931	BB 8932	BB 8933
I. Cornea						
A. Density	0	1[p]	0	0	0	0
B. Area	0	1	0	0	0	0
A x B x 5	0	5	0	0	0	0
II. Iris						
A. Values	0	0	0	0	0	0
A x 5	0	0	0	0	0	0
III. Conjunctivae						
A. Redness	0	0[+]	0[+]	0	0[+]	0[+]
B. Chemosis	0	0	0	0	0	0
C. Discharge	0	0	0	0	0	0
(A + B + C) x 2	0	0	0	0	0	0
Total I + II + III	0	5	0	0	0	0
Reaction to Fluorescein**	0	0	0	0	0	0
Mean		1.7			0.0	
S.D.		2.9			0.0	
S.E.		1.7			0.0	

** Any fluorescein stain retention in the eye was considered to be epithelial swelling/erosion and not a true stromal opacity. Values were not included in the totals and means.
+ = Test article stain (black/gold) on right side of face
p = Pannus

TABLE 7: INDIVIDUAL BODY WEIGHT AND OCULAR REACTION DATA

PRIMARY EYE IRRITATION STUDY IN RABBITS

TEST ARTICLE: FOG OIL

Time Interval	Prior to Instillation			24 (±2) Hours			48 (±2) Hours			72 (±2) Hours		
Animal Number	BB 8871	BB 8872	BB 8873	BB 8871	BB 8872	BB 8873	BB 8871	BB 8872	BB 8873	BB 8871	BB 8872	BB 8873
Body Weight (kg)	2.04	2.34	2.32									
I. Cornea												
A. Density	0	0	0	0	0	0	0	0	0	0	0	0
B. Area	0	0	0	0	0	0	0	0	0	0	0	0
A x B x 5	0	0	0	0	0	0	0	0	0	0	0	0
II. Iris												
A. Values	0	0	0	0	0	0	0	0	0	0	0	0
A x 5	0	0	0	0	0	0	0	0	0	0	0	0
III. Conjunctivae												
A. Redness	0	0	0	0	0	0	0	0	0	0	0	0
B. Chemosis	0	0	0	0	0	0	0	0	0	0	0	0
C. Discharge	0	0	0	0	0	0	0	0	0	0	0	0
(A + B + C) x 2	0	0	0	0	0	0	0	0	0	0	0	0
Total I + II + III	0	0	0	0	0	0	0	0	0	0	0	0
Reaction to Fluorescein**	0	0	0	0	0	0	0	0	0	0	0	0
Mean		0.0			0.0			0.0			0.0	
S.D.		0.0			0.0			0.0			0.0	
S.E.		0.0			0.0			0.0			0.0	

** Any fluorescein stain retention in the eye was considered to be epithelial swelling/erosion and not a true stromal opacity. Values were not included in the totals and means.

TABLE 8: INDIVIDUAL BODY WEIGHT AND OCULAR REACTION DATA

PRIMARY EYE IRRITATION STUDY IN RABBITS

TEST ARTICLE: DIESEL FUEL

Time Interval	Prior to Instillation			24 (±2) Hours			48 (±2) Hours			72 (±2) Hours		
Animal Number	BB 8874	BB 8875	BB 8877	BB 8874	BB 8875	BB 8877	BB 8874	BB 8875	BB 8877	BB 8874	BB 8875	BB 8877
Body Weight (kg)	2.32	2.16	2.10									
I. Cornea												
A. Density	0	0	0	0	0	0	0	0	0	0	0	0
B. Area	0	0	0	0	0	0	0	0	0	0	0	0
A x B x 5	0	0	0	0	0	0	0	0	0	0	0	0
II. Iris												
A. Values	0	0	0	0	0	0	0	0	0	0	0	0
A x 5	0	0	0	0	0	0	0	0	0	0	0	0
III. Conjunctivae												
A. Redness	0	0	0	0	0	0	0	0	0	0	0	0
B. Chemosis	0	0	0	0	0	0	0	0	0	0	0	0
C. Discharge	0	0	0	0	0	0	0	0	0	0	0	0
(A + B + C) x 2	0	0	0	0	0	0	0	0	0	0	0	0
Total I + II + III	0	0	0	0	0	0	0	0	0	0	0	0
Reaction to Fluorescein**	0	0	0	0	0	0	0	0	0	0	0	0
Mean		0.0			0.0			0.0			0.0	
S.D.		0.0			0.0			0.0			0.0	
S.E.		0.0			0.0			0.0			0.0	

** Any fluorescein stain retention in the eye was considered to be epithelial swelling/erosion and not a true stromal opacity. Values were not included in the totals and means.

TABLE 9: INDIVIDUAL BODY WEIGHT AND OCULAR REACTION DATA

PRIMARY EYE IRRITATION STUDY IN RABBITS

TEST ARTICLE: 0.75 PARTS FOG OIL: 1 PART BRASS POWDER

Time Interval	Prior to Instillation			24 (±2) Hours			48 (±2) Hours			72 (±2) Hours		
Animal Number	BB 8878	BB 8879	BB 8880	BB 8878	BB 8879	BB 8880	BB 8878	BB 8879	BB 8880	BB 8878	BB 8879	BB 8880
Body Weight (kg)	2.48	2.24	2.54									
I. Cornea												
A. Density	0	0	0	0	0	0	0	0	0	0	0	0
B. Area	0	0	0	0	0	0	0	0	0	0	0	0
A x B x 5	0	0	0	0	0	0	0	0	0	0	0	0
II. Iris												
A. Values	0	0	0	0	0	0	0	0	0	0	0	0
A x 5	0	0	0	0	0	0	0	0	0	0	0	0
III. Conjunctivae												
A. Redness	0	0	0	1+	1+	1+	0+	0+	0+	0+	0+	0+
B. Chemosis	0	0	0	1	1	1	0	0	0	0	0	0
C. Discharge	0	0	0	0	0	0	0	0	0	0	0	0
(A + B + C) x 2	0	0	0	4	4	4	0	0	0	0	0	0
Total I + II + III	0	0	0	4	4	4	0	0	0	0	0	0
Reaction to Fluorescein**	0	0	0	0	0	0	0	0	0	0	0	0
Mean		0.0			4.0			0.0			0.0	
S.D.		0.0			0.0			0.0			0.0	
S.E.		0.0			0.0			0.0			0.0	

** Any fluorescein stain retention in the eye was considered to be epithelial swelling/erosion and not a true stromal opacity. Values were not included in the totals and means.
+ = Eyelids discolored gold

TABLE 10: INDIVIDUAL BODY WEIGHT AND OCULAR REACTION DATA

PRIMARY EYE IRRITATION STUDY IN RABBITS

TEST ARTICLE: 0.75 PARTS FOG OIL: 1 PART BRASS POWDER

Time Interval	Prior to Instillation			24 (±2) Hours			48 (±2) Hours			72 (±2) Hours		
Animal Number	BB 8934	BB 8936	BB 8938	BB 8934	BB 8936	BB 8938	BB 8934	BB 8936	BB 8938	BB 8934	BB 8936	BB 8938
Body Weight (kg)	2.04	2.00	2.40									
I. Cornea												
A. Density	0	0	0	0	0	0	0	0	0	0	0	0
B. Area	0	0	0	0	0	0	0	0	0	0	0	0
A x B x 5	0	0	0	0	0	0	0	0	0	0	0	0
II. Iris												
A. Values	0	0	0	0	0	0	0	0	0	0	0	0
A x 5	0	0	0	0	0	0	0	0	0	0	0	0
III. Conjunctivae												
A. Redness	0	0	0	0+	0+	0+	0+	0+	0+	0+	0+	0+
B. Chemosis	0	0	0	0	0	0	0	0	0	0	0	0
C. Discharge	0	0	0	0	0	0	0	0	0	0	0	0
(A + B + C) x 2	0	0	0	0	0	0	0	0	0	0	0	0
Total I + II + III	0	0	0	0	0	0	0	0	0	0	0	0
Reaction to Fluorescein**	0	0	0	0	0	0	0	0	0	0	0	0
Mean		0.0			0.0			0.0			0.0	
S.D.		0.0			0.0			0.0			0.0	
S.E.		0.0			0.0			0.0			0.0	

** Any fluorescein stain retention in the eye was considered to be epithelial swelling/erosion and not a true stromal opacity. Values were not included in the totals and means.

+ = Eyelids discolored gold

TABLE 11: INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: BRASS POWDER

Animal Number	Sex	Body Weight (kilograms) Day of Study 0	3	7	10	14	Total Weight Change (kg)	Amount of Test Article Administered (mg)
BB8896	M	2.58	2.40	2.66	2.78	2.90	0.32	5,160
BB8899	M	2.60	2.48	2.64	2.80	2.90	0.30	5,200
BB8900	M	2.56	2.34	2.54	2.68	2.80	0.24	5,120
BB8901	M	2.82	2.60	2.86	2.94	3.08	0.26	5,640
BB8902	M	2.52	2.32	2.60	2.70	2.84	0.32	5,040
Mean		2.62	2.43	2.66	2.78	2.90	0.29	5,232
S.D.		0.12	0.11	0.12	0.10	0.11	0.04	236
S.E.		0.05	0.05	0.05	0.05	0.05	0.02	105
BB8951	F	2.32	2.10	2.36	2.56	2.76	0.44	4,640
BB8952	F	2.42	2.36	2.48	2.58	2.70	0.28	4,840
BB8953	F	2.34	2.20	2.46	2.58	2.70	0.36	4,680
BB8954	F	2.50	2.30	2.50	2.60	2.68	0.18	5,000
BB8955	F	2.34	2.14	2.26	2.34	2.44	0.10	4,680
Mean		2.38	2.22	2.41	2.53	2.66	0.27	4,768
S.D.		0.08	0.11	0.10	0.11	0.12	0.14	151
S.E.		0.03	0.05	0.04	0.05	0.06	0.06	67

TABLE 12: INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: BRASS POWDER

		Day(s) Finding Observed									
Finding	Animal No.: Sex:	BB8896 (M)	BB8899 (M)	BB8900 (M)	BB8901 (M)	BB8902 (M)	BB8951 (F)	BB8952 (F)	BB8953 (F)	BB8954 (F)	BB8955 (F)
Erythema at test site		1-5	1,2	1,2	1-4	1-6	1-3	1-4	1-4	1-3	1-3
Edema at test site		1,2	1,2	1,2	1-3	1-3	1,2	1-3	1,2	1,2	1,2
Test site and surrounding fur stained gold/black		1-14	1-14	1-14	1-14	1-14	1-14	1-14	1-14	1-14	1-14
Desquamation at test site		6-13				6-10		6-10	6-10		6-10
Food appears undisturbed							3				
Few stools							2,3	2			
Eye discharge (both eyes)			14								
No abnormalities		0	0	0	0	0	0	0	0	0	0

TABLE 13

INDIVIDUAL NECROPSY FINDINGS

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: BRASS POWDER

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
BB8896	M	None
BB8899	M	Treated skin - diffuse, dark green discoloration
BB8900	M	Kidneys - diffuse, pale discoloration
BB8901	M	None
BB8902	M	None
BB8951	F	None
BB8952	F	None
BB8953	F	None
BB8954	F	None
BB8955	F	None

TABLE 14: INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: FOG OIL

Animal Number	Sex	Body Weight (kilograms) Day of Study 0	3	7	10	14	Total Weight Change (kg)	Amount of Test Article Administered (mg)	(ml)
BB8886	M	2.42	2.32	2.40	2.50	2.62	0.20	4,856	5.4
BB8887	M	2.56	2.54	2.62	2.80	2.96	0.40	5,125	5.7
BB8888	M	2.68	2.64	2.62	2.92	3.10	0.42	5,395	6.0
BB8889	M	2.20	2.18	2.20	2.32	2.40	0.20	4,406	4.9
BB8890	M	2.48	2.40	2.40	2.54	2.62	0.14	4,946	5.5
Mean		2.47	2.42	2.45	2.62	2.74	0.27	4,946	5.5
S.D.		0.18	0.18	0.18	0.24	0.28	0.13	365	0.4
S.E.		0.08	0.08	0.08	0.11	0.13	0.06	163	0.2
BB8937	F	2.04	1.98	2.18	2.28	2.42	0.38	4,046	4.5
BB8941	F	2.86	2.64	2.82	3.04	3.22	0.36	5,755	6.4
BB8942	F	2.54	2.50	2.64	2.72	2.90	0.36	5,036	5.6
BB8943	F	2.70	2.56	2.78	2.96	3.02	0.32	5,395	6.0
BB8944	F	2.54	2.46	2.68	2.76	2.88	0.34	5,036	5.6
Mean		2.54	2.43	2.62	2.75	2.89	0.35	5,054	5.6
S.D.		0.31	0.26	0.26	0.30	0.29	0.02	637	0.7
S.E.		0.14	0.12	0.11	0.13	0.13	0.01	285	0.3

TABLE 15

INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: FOG OIL

Finding	Animal No.: / Sex:	BB8886 (M)	BB8887 (M)	BB8888 (M)	BB8889 (M)	BB8890 (M)	BB8937 (F)	BB8941 (F)	BB8942 (F)	BB8943 (F)	BB8944 (F)
		Day(s) Finding Observed									
Vocalized shortly after test article removal							1		1		
Erythema at test site		2-6	2-6	2-6	2-6	2-6	2-7		2-7	2-6	2-7
Edema at test site		2-6	2-6	2-6	2-6	2-6	2-7		2-6	2-6	2-7
Desquamation at test site		5-11	6-8	6-11	6-8	6-11	6-11	7-11	5-11	6-12	6-11
Eye discharge (both eyes)					13						
Crusty eyes					14						
No abnormalities		0,1, 12-14	0,1, 9-14	0,1, 12-14	0,1, 9-12	0,1, 12-14	0,12-14	0-6, 12-14	0,12-14	0,1, 13,14	0,1, 12-14

TABLE 16

INDIVIDUAL NECROPSY FINDINGS

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: FOG OIL

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
BB8886	M	Treated skin - fur slightly crusted
BB8887	M	None
BB8888	M	None
BB8889	M	Treated skin - multiple focal, red discoloration External surface (around eyes) - crusty material
BB8890	M	None
BB8937	F	Treated skin - multiple focal, red discoloration
BB8941	F	None
BB8942	F	None
BB8943	F	Treated skin - multiple focal, red discoloration
BB8944	F	None

TABLE 17

INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: DIESEL FUEL

Animal Number	Sex	Body Weight (kilograms) Day of Study 0	3	7	10	13	14	Total Weight Change (kg)	Amount of Test Article Administered (mg)	(ml)
BB9027	M	2.14	2.08	2.14	2.30	-	2.36	0.22	4,283	5.1
BB9028	M	2.18	2.10	2.18	2.28	-	2.42	0.24	4,367	5.2
BB9030	M	2.20	2.12	2.28	2.16	(1.94)	-	-	4,367	5.2
BB9031	M	2.20	2.08	2.40	2.58	-	2.70	0.50	4,367	5.2
BB9032	M	2.56	2.44	2.58	2.70	-	2.58	0.02	5,123	6.1
Mean		2.26	2.16	2.32	2.40		2.52	0.25	4,501	5.4
S.D.		0.17	0.16	0.18	0.23		0.15	0.20	349	0.4
S.E.		0.08	0.07	0.08	0.10		0.08	0.10	156	0.2
BB9053	F	2.54	2.44	2.62	2.76	-	2.86	0.32	5,039	6.0
BB9054	F	2.22	2.10	2.28	2.40	-	2.54	0.32	4,451	5.3
BB9055	F	2.50	2.32	2.52	2.62	-	2.68	0.18	5,039	6.0
BB9057	F	2.66	2.52	2.70	2.62	-	2.48	-0.18	5,291	6.3
BB9059	F	2.50	2.50	2.46	2.26	-	2.64	0.14	5,039	6.0
Mean		2.48	2.38	2.52	2.53		2.64	0.16	4,972	5.9
S.D.		0.16	0.17	0.16	0.20		0.15	0.20	311	0.4
S.E.		0.07	0.08	0.07	0.09		0.07	0.09	139	0.2

NOTE: Value in parentheses denotes found dead body weight and is not included in the statistical analyses.

TABLE 18

INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: DIESEL FUEL

Finding	Animal No.: Sex:	BB9027 (M)	BB9028 (M)	BB9030 (M)	BB9031 (M)	BB9032 (M)	BB9053 (F)	BB9054 (F)	BB9055 (F)	BB9057 (F)	BB9059 (F)
		Day(s) Finding Observed									
Erythema at test site		1-6	1-10	1-13	1-6	1-6	1-5	1-12	1-12	1-4	1-4
Edema at test site		1-6	1-7	1-7, 11-13	1-6	1-6	1-5	1-9	1-7	1-4	1-4
Eschar formation at test site		4-6	3-10	3-13	4-6			3-12	4-12		
Desquamation at test site		4-14	4-14	4-13	4-14	4-14	5-14	4-14	4-14	5-14	5-14
Atonia at test site		4-6	4-6	4-6	4-6	5,6		4-8			
Red discharge from test site								1			
Fissures at test site								5,6			
Denuded area on test site		11-14	11-14		11-14	11-14	11-14	11-14	11-14	11-14	11-14
Few stools				11	3						
No stools											7,8
Loose stools				10		14				14	9,10
Foamy loose stools				12,13							
Food appears undisturbed				12,13	3						8
Death				13							
No abnormalities		0	0	0	0	0	0	0	0	0	0

TABLE 19

INDIVIDUAL NECROPSY FINDINGS

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: DIESEL FUEL

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
BB9027	M	Treated skin - thickened, mild; crusted, tan, mild
BB9028	M	Treated skin - crusted, tan, mild
BB9030*	M	Treated skin - thickened, mild; crusted, tan discoloration; abscess Stomach - distended with gas and fluid; multiple focal, black discoloration on mucosa Cecum - distended with gas Intestine - mucoid and fluid contents External surface - dried fecal material, perianal region
BB9031	M	Treated skin - crusted, tan, mild
BB9032	M	Treated skin - thickened, mild; crusted, tan, moderate; multiple focal, tan/red scabs Stomach - fluid contents Colon - mucoid contents External Surface - fecal material, lower abdominal and perianal regions
BB9053	F	Treated skin - thickened, mild; crusted, red/tan, mild
BB9054	F	Treated skin - thickened, mild; crusted, tan, mild; solitary, red/tan scab
BB9055	F	Treated skin - thickened, mild; crusted, tan, mild; multiple focal, red/tan scabs Lung (left diaphragmatic lobe) - multiple focal, red discoloration
BB9057	F	Treated skin - crusted, tan, moderate Stomach - fluid contents Intestine - fluid contents Lung - multiple focal, red discoloration
BB9059	F	Treated skin - thickened, mild; crusted, tan, mild; multiple focal, brown scabs

* Animal was found dead on day 13 of the study.

TABLE 20

INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: 0.75 PARTS FOG OIL: 1 PART BRASS POWDER

Animal Number	Sex	Body Weight (kilograms) Day of Study 0	3	7	10	14	Total Weight Change (kg)	Amount of Test Article Administered (mg)	(ml)
BB8891	M	2.80	2.66	2.80	2.98	3.06	0.26	5,542	3.2
BB8892	M	2.89	2.92	3.10	3.24	3.30	0.41	5,716	3.3
BB8893	M	2.94	2.80	3.06	3.24	3.36	0.42	5,889	3.4
BB8894	M	2.92	2.76	2.98	3.20	3.20	0.28	5,889	3.4
BB8895	M	2.74	2.68	2.80	2.90	3.08	0.34	5,542	3.2
Mean		2.86	2.76	2.95	3.11	3.20	0.34	5,716	3.3
S.D.		0.09	0.10	0.14	0.16	0.13	0.07	174	0.1
S.E.		0.04	0.05	0.06	0.07	0.06	0.03	78	0.0
BB8945	F	2.42	2.40	2.56	2.74	2.72	0.30	4,850	2.8
BB8946	F	2.80	2.56	2.82	2.96	3.14	0.34	5,542	3.2
BB8947	F	2.78	2.56	2.74	2.88	3.06	0.28	5,542	3.2
BB8948	F	2.98	2.78	3.08	3.26	3.38	0.40	5,889	3.4
BB8949	F	2.46	2.36	2.56	2.66	2.78	0.32	4,850	2.8
Mean		2.69	2.53	2.75	2.90	3.02	0.33	5,335	3.1
S.D.		0.24	0.17	0.22	0.23	0.27	0.05	465	0.3
S.E.		0.11	0.07	0.10	0.10	0.12	0.02	208	0.1

TABLE 21

INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: 0.75 PARTS FOG OIL: 1 PART BRASS POWDER

		Day(s) Finding Observed									
Finding	Animal No.: Sex:	BB8891 (M)	BB8892 (M)	BB8893 (M)	BB8894 (M)	BB8895 (M)	BB8945 (F)	BB8946 (F)	BB8947 (F)	BB8948 (F)	BB8949 (F)
Erythema at test site		2-11	2,3	2	2	2,3	2-6	2-7	2-7	2-7	2-7
Edema at test site		2-11	2,3	2	2	2,3	2,3	2-7	2,3	2,3	2,3
Desquamation at test site		12-14		7-9		7-9	7-13	7-13	7-11	7-9	7-11
Test site discolored gold		2-13	2-11	2-11	2-11	2-11	2-12	2-12	2-12	2-11	2-8
No abnormalities		0,1	0,1, 12-14	0,1 12-14	0,1 12-14	0,1 12-14	0,1,14	0,1,14	0,1 13,14	0,1 12-14	0,1 12-14

TABLE 22

INDIVIDUAL NECROPSY FINDINGS

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: 0.75 PARTS FOG OIL: 1 PART BRASS POWDER

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
BB8891	M	Treated skin - thickened, mild; diffuse, tan discoloration with slight crusting
BB8892	M	None
BB8893	M	None
BB8894	M	None
BB8895	M	Kidneys - diffuse, pale, discoloration
BB8945	F	Treated skin - diffuse, dark green discoloration
BB8946	F	Treated skin - scattered, faint, dark green discoloration
BB8947	F	Kidney (left) - absent Kidney (right) - enlarged
BB8948	F	None
BB8949	F	None

TABLE 23

INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: 0.70 PARTS DIESEL FUEL: 1 PART BRASS POWDER

Animal Number	Sex	Body Weight (kilograms) Day of Study 0	3	7	10	14	Total Weight Change (kg)	Amount of Test Article Administered (mg)	(ml)
BB9033	M	2.26	1.90	2.14	2.28	2.50	0.24	4,597	2.8
BB9035	M	2.36	2.04	2.28	2.46	2.76	0.40	4,761	2.9
BB9037	M	2.30	2.10	2.12	2.18	2.36	-0.02	4,761	2.9
BB9038	M	2.12	2.04	2.30	2.36	2.18	0.06	4,268	2.6
BB9040	M	2.20	2.00	2.38	2.40	2.52	0.32	4,433	2.7
Mean		2.26	2.02	2.24	2.34	2.46	0.20	4,564	2.8
S.D.		0.11	0.07	0.11	0.11	0.21	0.18	214	0.1
S.E.		0.05	0.03	0.05	0.05	0.10	0.08	96	0.1
BB9062	F	2.42	2.18	2.26	2.22	2.28	-0.14	4,761	2.9
BB9063	F	2.40	2.18	2.46	2.64	2.70	0.30	4,761	2.9
BB9064	F	2.14	2.00	2.24	2.28	2.40	0.26	4,268	2.6
BB9065	F	2.30	1.96	2.28	2.46	2.62	0.32	4,597	2.8
BB9066	F	2.36	1.98	2.20	2.28	2.28	-0.08	4,761	2.9
Mean		2.32	2.06	2.29	2.38	2.46	0.13	4,630	2.8
S.D.		0.11	0.11	0.10	0.17	0.19	0.22	214	0.1
S.E.		0.05	0.05	0.04	0.08	0.09	0.10	96	0.1

TABLE 24

INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: 0.70 PARTS DIESEL FUEL: 1 PART BRASS POWDER

					Day(s) Finding Observed					
Finding	Animal No.: BB9033 Sex: (M)	BB9035 (M)	BB9037 (M)	BB9038 (M)	BB9040 (M)	BB9062 (F)	BB9063 (F)	BB9064 (F)	BB9065 (F)	BB9066 (F)
Erythema at test site	1-11	1-10	1-10	1-10	1-10	1-10	1-5	1-5	1-11	1-10
Edema at test site	1-10	1-10	1-10	1-9	1-9	1-7	1-5	1-5	1-7	1-7
Some of skin on test site peeled off during test article removal	1	1	1	1	1				1	1
Eschar formation at test site	2-11	2-10	2-10	2-10	2-10				4-11	2-10
Atonia at test site	5-7	4-7	4-7	4-8	4-8				5,6	4-6
Desquamation at test site	6-14	5-14	5-14	5-14	5-14	7-14	7-14	7-14	6-14	6-14
Test site discolored gold	1-14	1-14		1-14	1-14	1-14	1-14	1-14	1-14	1-13
Red discharge at test site										1
Denuded area on test site						12-14	12-14	12-14	12-14	12-14
Few stools					14					
Food appears undisturbed					14					
Moist rales										13,14
No abnormalities	0	0	0	0	0	0	0	0	0	0

TABLE 25

INDIVIDUAL NECROPSY FINDINGS

ACUTE DERMAL TOXICITY STUDY IN RABBITS

TEST ARTICLE: 0.70 PARTS DIESEL FUEL: 1 PART BRASS POWDER

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
BB9033	M	Treated skin - diffuse, red discoloration; multiple focal, red discoloration; crusted, tan, mild
BB9035	M	Treated skin - crusted, dark green, mild; focal, red discoloration Lung - multiple focal, red discoloration
BB9037	M	Treated skin - crusted, tan, moderate
BB9038	M	None
BB9040	M	Treated skin - crusted, dark green and tan, mild Kidney - discoloration, diffuse, pale, bilateral
BB9062	F	Treated skin - crusted, tan, mild
BB9063	F	Treated skin - crusted, tan, mild
BB9064	F	None
BB9065	F	Treated skin - thickened, mild; crusted, dark green and tan
BB9066	F	Treated skin - crusted, tan, mild; scattered areas of thin haircoat

TABLE 26

INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: BRASS POWDER

Animal Number	Sex	Body Weight (grams) Day of Study* 0	2	3	4	6	7	10	14	Amount of Test Article Administered (mg)	(ml)
AG7886	M	165	(145)	-	-	-	-	-	-	850	1.7
AG7887	M	181	-	157	-	-	163	180	207	900	1.8
AG7888	M	165	-	134	(128)	-	-	-	-	850	1.7
AG7889	M	166	-	140	(137)	-	-	-	-	850	1.7
AG7890	M	175	-	143	(137)	-	-	-	-	900	1.8
Mean		170		144						870	1.7
S.D.		7		10						27	0.1
S.E.		3		5						12	0.0
AG7922	F	152	-	(129)	-	-	-	-	-	750	1.5
AG7923	F	151	-	131	-	(129)	-	-	-	750	1.5
AG7924	F	154	-	137	-	(121)	-	-	-	750	1.5
AG7925	F	161	-	135	(115)	-	-	-	-	800	1.6
AG7926	F	156	-	(133)	-	-	-	-	-	800	1.6
Mean		155		134						770	1.5
S.D.		4		3						27	0.1
S.E.		2		2						12	0.0

* Day -1 denotes body weight on the day fasted; day 0 denotes fasted body weight the day of dose administration; day 14 denotes final body weight prior to final sacrifice; values in parentheses denote found dead body weights and are not included in the statistical analyses.

TABLE 27

INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: BRASS POWDER

Finding	Animal No.: / Sex:	AG7886 (M)	AG7887 (M)	AG7888 (M)	AG7889 (M)	AG7890 (M)	AG7922 (F)	AG7923 (F)	AG7924 (F)	AG7925 (F)	AG7926 (F)
		Day(s) Finding Observed									
Loose stools		0,1	0-4	0-3	0,2,3	0-3	0-2	0-4	1-5	0-5	0-2
Gold colored stools		0	0	0	0	0	0	0		0	0
Yellow/brown stained fur - perianal region		0,1	0-9	0-3	0-3	0-3	0-2	0-4	1-5	0-5	0-2
Crusty muzzle		1	1-5	1-3	1-3	1-3	1,2	1-4	1-5	1-5	1,2
Lethargy				3	3		2	4	5		2
Ataxia											2
Squinting								4		5	2
Damp fur - perianal region			3							3	
Crusty eyes										4,5	
Dark colored stool									5	5	
Red stains on cage board									5		
Base of tail and scrotum appear scabby			4-14								
Death		2		4	4	4	3	4	6	6	3
No abnormalities									0		

TABLE 28

INDIVIDUAL NECROPSY FINDINGS

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: BRASS POWDER

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
AG7886	M	Stomach - distended with fluid Nonglandular stomach - gold discoloration Intestines - distended with fluid External surface - green staining of perineum
AG7887*	M	Skin (base of tail and perianal region) - scabbed
AG7888	M	Nonglandular stomach - diffuse, gold discoloration External surface - stained green around nose, mouth, and perianal region
AG7889	M	Nonglandular stomach - diffuse, gold discoloration Glandular stomach - multiple focal, brown discoloration on mucosa Intestine - fluid contents External surface - stained green, perianal region
AG7890	M	Nonglandular stomach - diffuse, gold discoloration Intestine - dark green contents External surface- stained green, perianal region
AG7922	F	Nonglandular stomach - gold discoloration External surface - green staining of perineum
AG7923	F	Nonglandular stomach - diffuse, gold discoloration Intestine - dark contents Liver - diffuse, pale discoloration Lung - diffuse, pale discoloration Skin (base of tail) - red discoloration External surface - stained green, perianal region

* Only animal to survive to day 14.

TABLE 28 (continued)

INDIVIDUAL NECROPSY FINDINGS

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: BRASS POWDER

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
AG7924	F	Nonglandular stomach - gold material adhered to mucosa Small intestine - green contents Liver - pale Lung - pale External surfaces - green staining, perianal region and tail
AG7925	F	Nonglandular stomach - gold material adhered to mucosa Small intestine - green contents External surfaces - green staining, perianal region and tail
AG7926	F	Nonglandular stomach - gold discoloration External surface - green staining of perineum

TABLE 29

INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: FOG OIL

Animal Number	Sex	Body Weight (grams) Day of Study* 0	3	7	10	14	Amount of Test Article Administered (mg)	(ml)
AG7891	M	172	189	201	212	222	863	0.96
AG7892	M	179	194	207	219	228	899	1.00
AG7893	M	186	203	212	219	233	899	1.00
AG7894	M	166	178	184	188	197	827	0.92
AG7895	M	180	194	202	207	207	899	1.00
Mean		177	192	201	209	217	877	0.98
S.D.		8	9	11	13	15	32	0.04
S.E.		3	4	5	6	7	14	0.02
AG7927	F	147	151	159	163	167	737	0.82
AG7928	F	152	161	168	176	182	764	0.85
AG7929	F	157	159	170	176	181	782	0.87
AG7930	F	157	167	176	179	182	782	0.87
AG7931	F	153	166	171	175	182	764	0.85
Mean		153	161	169	174	179	766	0.85
S.D.		4	6	6	6	7	18	0.02
S.E.		2	3	3	3	3	8	0.01

* Day -1 denotes body weight on the day prior to dose administration; day 0 denotes fasted body weight the day of dose administration; day 14 denotes final body weight prior to final sacrifice.

TABLE 30

INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: FOG OIL

Finding	Animal No.: Sex:	AG7891 (M)	AG7892 (M)	AG7893 (M)	AG7894 (M)	AG7895 (M)	AG7927 (F)	AG7928 (F)	AG7929 (F)	AG7930 (F)	AG7931 (F)
		Day(s) Finding Observed									
Damp fur - perianal region		0	0	0	0	0	0	0	0	0	0
Yellow/brown stained fur - perianal region		0,1	0,1	0,1	0,1	0-2	0-2	0-2	0-2	0-6	0-2
Crusty eyes										1	
No abnormalities		2-14	2-14	2-14	2-14	3-14	3-14	3-14	3-14	7-14	3-14

TABLE 31

INDIVIDUAL NECROPSY FINDINGS

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: FOG OIL

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
AG7891	M	None
AG7892	M	None
AG7893	M	None
AG7894	M	None
AG7895	M	None
AG7927	F	Ovary (left) - clear cyst
AG7928	F	None
AG7929	F	None
AG793Ø	F	None
AG7931	F	None

TABLE 32

INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: DIESEL FUEL

Animal Number	Sex	Body Weight (grams) Day of Study* 0	3	7	10	14	Amount of Test Article Administered (mg)	(ml)
AG7873	M	175	174	191	201	209	840	1.0
AG7874	M	178	186	199	207	216	924	1.1
AG7875	M	168	179	191	201	210	840	1.0
AG7876	M	168	179	199	211	222	840	1.0
AG7878	M	166	181	194	208	221	832	0.99
Mean		171	180	195	206	216	855	1.02
S.D.		5	4	4	4	6	39	0.05
S.E.		2	2	2	2	3	17	0.02
AG7910	F	154	158	167	175	184	773	0.92
AG7911	F	147	155	161	164	169	739	0.88
AG7912	F	146	155	163	165	166	731	0.87
AG7914	F	144	151	156	162	169	722	0.86
AG7920	F	156	161	165	171	179	781	0.93
Mean		149	156	162	167	173	749	0.89
S.D.		5	4	4	5	8	26	0.03
S.E.		2	2	2	2	3	12	0.01

* Day -1 denotes body weight on the day prior to dose administration; day 0 denotes fasted body weight the day of dose administration; day 14 denotes final body weight prior to final sacrifice.

TABLE 33

INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: DIESEL FUEL

Finding	Animal No.: Sex:	AG7873 (M)	AG7874 (M)	AG7875 (M)	AG7876 (M)	AG7878 (M)	AG7910 (F)	AG7911 (F)	AG7912 (F)	AG7914 (F)	AG7920 (F)
		Day(s) Finding Observed									
Squinting		0	0	0	0	0	0	0	0	0	0
Lethargy		0	0	0	0	0		0	0	0	0
Lacrimation			0	0	0	0	0	0	0	0	0
Crusty nose							1	1	1	1	1
Damp fur - perianal region		1	1	1	1	1	1-2	1	1	1	1
Yellow/brown stained fur - perianal region		1	1-2	1	1-2	1	1-3	1	1-2	1-2	1-2
No abnormalities		2-14	3-14	2-14	3-14	2-14	4-14	2-14	3-14	3-14	3-14

TABLE 34

INDIVIDUAL NECROPSY FINDINGS

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: DIESEL FUEL

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
AG7873	M	None
AG7874	M	None
AG7875	M	None
AG7876	M	Lung - diffuse, red discoloration
AG7878	M	None
AG7910	F	Ovary (right) - clear cyst
AG7911	F	None
AG7912	F	None
AG7914	F	None
AG7920	F	Lung (right diaphragmatic and left lobes) - multiple focal, red discoloration Ovary (right) - clear cyst

TABLE 35

INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: 0.75 PARTS FOG OIL: 1 PART BRASS POWDER

Animal Number	Sex	Body Weight (grams) Day of Study* 0	3	7	10	14	Amount of Test Article Administered (mg)	(ml)
AG7879	M	168	181	198	207	216	831	0.48
AG7880	M	172	185	197	207	212	866	0.50
AG7881	M	178	195	202	210	220	883	0.51
AG7882	M	169	189	205	214	218	849	0.49
AG7883	M	175	193	202	212	223	883	0.51
Mean		172	189	201	210	218	862	0.50
S.D.		4	6	3	3	4	23	0.01
S.E.		2	3	1	1	2	10	0.01
AG7915	F	150	159	166	168	170	745	0.43
AG7916	F	158	178	189	190	193	797	0.46
AG7917	F	155	170	182	183	186	779	0.45
AG7918	F	138	157	161	170	169	693	0.40
AG7919	F	141	156	159	160	163	710	0.41
Mean		148	164	171	174	176	745	0.43
S.D.		9	10	13	12	13	44	0.03
S.E.		4	4	6	5	6	20	0.01

* Day -1 denotes body weight on the day prior to dose administration; day 0 denotes fasted body weight the day of dose administration; day 14 denotes final body weight prior to final sacrifice.

TABLE 36

INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: 0.75 PARTS FOG OIL: 1 PART BRASS POWDER

Finding	Animal No.: Sex:	AG7879 (M)	AG7880 (M)	AG7881 (M)	AG7882 (M)	AG7883 (M)	AG7915 (F)	AG7916 (F)	AG7917 (F)	AG7918 (F)	AG7919 (F)
		Day(s) Finding Observed									
Squinting		0									
No abnormalities		1-14	0-14	0-14	0-14	0-14	0-14	0-14	0-14	0-14	0-14

TABLE 37

INDIVIDUAL NECROPSY FINDINGS

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: Ø.75 PARTS FOG OIL: 1 PART BRASS POWDER

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
AG7879	M	None
AG788Ø	M	None
AG7881	M	None
AG7882	M	None
AG7883	M	None
AG7915	F	None
AG7916	F	none
AG7917	F	None
AG7918	F	None
AG7919	F	None

TABLE 38

INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: 0.70 PARTS DIESEL FUEL: 1 PART BRASS POWDER

Animal Number	Sex	Body Weight (grams) Day of Study* 0	3	7	10	14	Amount of Test Article Administered (mg)	(ml)
AG7867	M	166	177	193	200	204	837	0.51
AG7868	M	171	185	201	205	216	854	0.52
AG7869	M	179	196	216	221	231	903	0.55
AG7870	M	180	198	219	225	231	903	0.55
AG7871	M	171	183	201	201	207	854	0.52
Mean		173	188	206	210	218	870	0.53
S.D.		6	9	11	12	13	31	0.02
S.E.		3	4	5	5	6	14	0.01
AG7904	F	143	158	166	167	169	722	0.44
AG7905	F	157	168	170	172	173	788	0.48
AG7906	F	149	163	169	169	169	739	0.45
AG7907	F	152	168	172	174	176	755	0.46
AG7908	F	148	162	166	166	167	739	0.45
Mean		150	164	169	170	171	749	0.46
S.D.		5	4	3	3	4	25	0.02
S.E.		2	2	1	2	2	11	0.01

* Day -1 denotes body weight on the day prior to dose administration; day 0 denotes fasted body weight the day of dose administration; day 14 denotes final body weight prior to final sacrifice.

TABLE 39

INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: 0.70 PARTS DIESEL FUEL: 1 PART BRASS POWDER

Finding	Animal No.: Sex:	AG7867 (M)	AG7868 (M)	AG7869 (M)	AG7870 (M)	AG7871 (M)	AG7904 (F)	AG7905 (F)	AG7906 (F)	AG7907 (F)	AG7908 (F)
		Day(s) Finding Observed									
Squinting						0					
Lethargy		0				0	0	0	0	0	0
Lacrimation							0	0	0	0	0
Crusty Muzzle		1	1	1						1	
Loose stools						0					
Yellow/brown stained fur - perianal region						0-1	1		1	1	1
No abnormalities		2-14	0,2-14	0,2-14	0-14	2-14	2-14	1-14	2-14	2-14	2-14

TABLE 40

INDIVIDUAL NECROPSY FINDINGS

ACUTE ORAL TOXICITY STUDY IN RATS

TEST ARTICLE: 0.70 PARTS DIESEL FUEL: 1 PART BRASS POWDER

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
AG7867	M	None
AG7868	M	None
AG7869	M	None
AG7870	M	None
AG7871	M	None
AG7904	F	None
AG7905	F	None
AG7906	F	None
AG7907	F	None
AG7908	F	None

TABLE 41

INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 891 mg/kg

Animal Number	Sex	Body Weight (grams) Day of Study* 0	3	7	10	14	Amount of Test Article Administered (mg)	(ml)
AH0395	M	190	181	196	214	235	169	1.9
AH0396	M	180	182	198	212	231	160	1.8
AH0397	M	179	164	184	197	216	160	1.8
AH0398	M	178	173	195	207	222	160	1.8
AH0399	M	185	195	214	221	240	169	1.9
Mean		182	179	197	210	229	164	1.8
S.D.		5	12	11	9	10	5	0.1
S.E.		2	5	5	4	4	2	0.0
AH0431	F	138	153	152	158	161	125	1.4
AH0432	F	140	152	155	158	162	125	1.4
AH0433	F	144	157	164	167	174	125	1.4
AH0435	F	148	159	163	165	175	134	1.5
AH0436	F	139	152	157	161	167	125	1.4
Mean		142	155	158	162	168	127	1.4
S.D.		4	3	5	4	7	4	0.0
S.E.		2	1	2	2	3	2	0.0

* Day -1 denotes body weight on the day fasted; day 0 denotes fasted body weight the day of dose administration; day 14 denotes final body weight prior to final sacrifice; values in parentheses denote found dead body weights and are not included in the statistical analyses.

TABLE 41 (continued)

INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 1413 mg/kg

Animal Number	Sex	Body Weight (grams) Day of Study* 0	3	5	7	10	14	Amount of Test Article Administered (mg)	(ml)
AG9258	M	221	194	-	208	226	249	311	2.2
AG9259	M	237	207	-	224	248	271	339	2.4
AG9260	M	245	218	(199)	-	-	-	353	2.5
AG9261	M	242	204	(194)	-	-	-	339	2.4
AG9262	M	231	188	(177)	-	-	-	325	2.3
Mean		235	202		216	237	260	333	2.4
S.D.		10	12		11	16	16	16	0.1
S.E.		4	5		8	11	11	7	0.1
AG9284	F	167	170	-	172	182	185	240	1.7
AG9285	F	161	150	(145)	-	-	-	226	1.6
AG9286	F	153	160	-	160	167	173	212	1.5
AG9287	F	161	169	-	169	177	179	226	1.6
AG9288	F	186	163	(156)	-	-	-	268	1.9
Mean		166	162		167	175	179	234	1.7
S.D.		12	8		6	8	6	21	0.2
S.E.		6	4		4	4	3	9	0.1

* Day -1 denotes body weight on the day fasted; day 0 denotes fasted body weight the day of dose administration; day 14 denotes final body weight prior to final sacrifice; values in parentheses denote found dead body weights and are not included in the statistical analyses.

TABLE 41 (continued)

INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 2239 mg/kg

Animal Number	Sex	Body Weight (grams) Day of Study* 0	2	3	4	5	6	7	10	14	Amount of Test Article Administered (mg)	(ml)
AG9248	M	209	(184)	-	-	-	-	-	-	-	470	2.1
AG9254	M	191	(167)	-	-	-	-	-	-	-	425	1.9
AG9255	M	212	-	181	-	-	-	199	210	231	470	2.1
AG9256	M	202	-	(169)	-	-	-	-	-	-	448	2.0
AG9257	M	215	-	176	(175)	-	-	-	-	-	493	2.2
Mean		206		179							461	2.1
S.D.		10		4							26	0.1
S.E.		4		3							12	0.1
AG9274	F	159	(136)	-	-	-	-	-	-	-	358	1.6
AG9280	F	151	(136)	-	-	-	-	-	-	-	336	1.5
AG9281	F	157	-	141	-	(134)	-	-	-	-	358	1.6
AG9282	F	152	-	132	(130)	-	-	-	-	-	336	1.5
AG9283	F	159	-	143	-	-	(136)	-	-	-	358	1.6
Mean		156		139							349	1.6
S.D.		4		6							12	0.1
S.E.		2		3							5	0.0

* Day -1 denotes body weight on the day fasted; day 0 denotes fasted body weight the day of dose administration; day 14 denotes final body weight prior to final sacrifice; values in parentheses denote found dead body weights and are not included in the statistical analyses.

TABLE 41 (continued)

INDIVIDUAL BODY WEIGHT AND TEST ARTICLE ADMINISTRATION DATA

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 3548 mg/kg

Animal Number	Sex	Body Weight (grams) Day of Study* 0	2	3	5	6	7	10	14	Amount of Test Article Administered (mg)	(ml)
AG9243	M	181	(157)	-	-	-	-	-	-	639	1.8
AG9244	M	200	-	179	-	-	152	158	197	710	2.0
AG9245	M	193	-	168	-	(136)	-	-	-	674	1.9
AG9246	M	191	-	156	(139)	-	-	-	-	674	1.9
AG9247	M	191	(169)	-	-	-	-	-	-	674	1.9
Mean		191		168						674	1.9
S.D.		7		12						25	0.1
S.E.		3		7						11	0.0
AG9269	F	145	(128)	-	-	-	-	-	-	532	1.5
AG9270	F	150	-	(128)	-	-	-	-	-	532	1.5
AG9271	F	148	-	(129)	-	-	-	-	-	532	1.5
AG9272	F	150	-	156	-	-	158	167	176	532	1.5
AG9273	F	149	(131)	-	-	-	-	-	-	532	1.5
Mean		148								532	1.5
S.D.		2								0	0.0
S.E.		1								0	0.0

* Day -1 denotes body weight on the day fasted; day 0 denotes fasted body weight the day of dose administration; day 14 denotes final body weight prior to final sacrifice; values in parentheses denote found dead body weights and are not included in the statistical analyses.

TABLE 42

INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 891 mg/kg

Finding	Animal No.: Sex:	AH0395 (M)	AH0396 (M)	AH0397 (M)	AH0398 (M)	AH0399 (M)	AH0431 (F)	AH0432 (F)	AH0433 (F)	AH0435 (F)	AH0436 (F)
		Day(s) Finding Observed									
Loose stools		0-2	0-2	0-2	0-2	1	0-2	0,1	0,1	0,1	0,1
Gold colored stools		0	0	0	0	0	0	0	0	0	0
Yellow/brown stained fur - perianal region		0-6	0-5	0-5	0-7	0-3	0-2	0-2	0-3	0-3	0-2
Crusty muzzle		1-5	1-4	1-5	1-7	1-3	1				
Damp fur - perianal region				3							
Base of tail appears scabby		3-13	3-13	3-13							
Scrotum appears scabby		3-13		3-13							
No abnormalities		14	14	14	8-14	4-14	3-14	3-14	4-14	4-14	3-14

TABLE 42 (continued)

INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 1413 mg/kg

Finding	Animal No.: Sex:	AG9258 (M)	AG9259 (M)	AG9260 (M)	AG9261 (M)	AG9262 (M)	AG9284 (F)	AG9285 (F)	AG9286 (F)	AG9287 (F)	AG9288 (F)
		Day(s) Finding Observed									
Loose stools		0-4	0-4	0-4	0-4	0-4	0-2	0-4	0-3	0-3	0-3
Gold colored stools		0-3	0	0	0	0	0	0	0	0	0
Yellow/brown stained fur - perianal region		0-5	0-5	0-4	0-4	0-4	0-5	0-5	0-14	0-5	0-4
Crusty muzzle		1-5	1-5	1-4	1-4	1-4	1,2	1-4	1,2	1,2	1-4
Lethargy					3,4			5			5
Ataxia								5			5
Pale								4,5			4,5
Damp fur - perianal region				3,4				3,4			
Crusty eyes				3,4	2-4	4	2				3,4
No stool								5			
Few stools											5
Base of tail and scrotum appear scabby		5-14	5-14								
Death				5	5	5		5			5
No abnormalities							6-14			6-14	

TABLE 42 (continued)

INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 2239 mg/kg

	Day(s) Finding Observed									
Animal No.: / Finding / Sex:	AG9248 (M)	AG9254 (M)	AG9255 (M)	AG9256 (M)	AG9257 (M)	AG9274 (F)	AG9280 (F)	AG9281 (F)	AG9282 (F)	AG9283 (F)
Loose stools	0-2	0,1	0-3	0-2	0-3	0-2	0,1	0-3	0-3	0-3
Gold colored stools	0,1	0,1	0	0,1	0,1	0,1	0,1	0,1	0,1	0,1
Yellow/brown stained fur - perianal region	0-2	0,1	0-8	0-2	0-3	0-2	0,1	0-4	0-3	0-5
Crusty muzzle	1,2	1	1-3	1,2	1-3	1,2	1	1-3	2,3	1-4
Lethargy	2							4		5
Ataxia										4,5
Squinting	2		2		2,3		1	0,2,3	3	
Pale								4		5
Lacrimation	2						0	0		
Crusty eyes				2	1,3	1	1	2-4	2,3	2-5
Crusty nose			4,5							
Dark colored stools	2		2-5		3			2-4	2,3	3,4
No stool										5
Piloerection								4		
Poor coat quality			5,6							
Base of tail and scrotum appear scabby			6-13							
Red area at base of tail			14							
Death	2	2		3	4	2	2	5	4	6

TABLE 42 (continued)

INDIVIDUAL ANTEMORTEM OBSERVATIONS

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 3548 mg/kg

Finding	Animal No.: / Sex:	AG9243 (M)	AG9244 (M)	AG9245 (M)	AG9246 (M)	AG9247 (M)	AG9269 (F)	AG9270 (F)	AG9271 (F)	AG9272 (F)	AG9273 (F)
		Day(s) Finding Observed									
Loose stools		0,1	0-6	0-6	0-4	0-2	0-2	0-2	0-2	0-2	0-2
Gold colored stools		0	0	0	0	0	0	0	0	0	0
Yellow/brown stained fur - perianal region		0,1	0-14	0-6	0-4	0,1	0-2	0-2	0-2	0-10	0-2
Crusty muzzle			1,7-9	2-6	2-4	1,2	2	1,2	2	1	2
Lethargy			6	6		2					
Ataxia				6							
Squinting				6	0-4	1,2		2			
Lacrimation		0		0							
Pale			6-8								
Crusty eyes			5	6	3,4	2	2	2	2	2-4	
Dark colored stools			7								
Emaciated			6-8	6	3,4						
Thin			11,12								
Poor coat quality			6-13								
Base of tail and scrotum appear scabby			6-10,13,14								
Tip of tail dark			14								
Death		2		6	5	2	2	3	3		2
No abnormalities										11-14	

TABLE 43

INDIVIDUAL NECROPSY FINDINGS

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 891 mg/kg

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
AH0395	M	None
AH0396	M	None
AH0397	M	None
AH0398	M	None
AH0399	M	None
AH0431	F	None
AH0432	F	None
AH0433	F	None
AH0435	F	None
AH0436	F	None

TABLE 43 (continued)

INDIVIDUAL NECROPSY FINDINGS

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 1413 mg/kg

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
AG9258	M	Skin - ulceration, base of tail
AG9259	M	Skin - ulceration, scabbed, base of tail
AG9260*	M	Stomach - dark contents Non-glandular stomach - mucosa coated with gold material Small intestine - dark contents External surface - green stained fur, perianal region
AG9261*	M	Stomach - dark contents Non-glandular stomach - mucosa covered with gold material Glandular stomach - discoloration, multiple focal, red, on mucosa Intestine - dark contents External surface - green stained fur, perianal region
AG9262*	M	Non-glandular stomach - coated with gold material on mucosa Small intestine - dark green contents External surface - green stained fur, perianal region
AG9284	F	None
AG9285*	F	Stomach - dark contents Glandular stomach - discoloration, multiple focal, brown, on mucosa Cecum - dark contents Colon - dark contents Liver - discoloration, diffuse, pale External surface - dark green stained fur, perianal region

*Animal found dead prior to final sacrifice.

TABLE 43 (continued)

INDIVIDUAL NECROPSY FINDINGS

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 1413 mg/kg

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
AG9286	F	None
AG9287	F	None
AG9288*	F	Stomach - dark contents Intestine - dark contents External surface - dark green staining, perianal region

*Animal found dead prior to final sacrifice.

TABLE 43 (continued)

INDIVIDUAL NECROPSY FINDINGS

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 2239 mg/kg

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
AG9248*	M	Stomach - glandular mucosa reddened, non-glandular mucosa colored gold Cecum - mucosa reddened External surface - stained dark green, perianal area
AG9254*	M	Non-glandular stomach - mucosa coated with gold material Small intestine - dark green contents Cecum - dark green contents External surface - dark green material, perianal region
AG92555	M	None
AG9256*	M	Non-glandular stomach - coated with gold material on mucosa Small intestine - dark contents Cecum - dark contents External surfaces - red/brown crusted material, nose and mouth area; dark green material, perianal region
AG9257*	M	Non-glandular stomach - colored gold Cecum - thick, green contents External surface - green discoloration, perianal region
AG9274*	F	Glandular stomach - mucosa reddened Non-glandular stomach - mucosa coated with gold material Small intestine - dark contents Cecum - dark contents External surface - dark green material, perianal region

*Animal found dead prior to final sacrifice.

TABLE 43 (continued)

INDIVIDUAL NECROPSY FINDINGS

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 2239 mg/kg

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
AG9280*	F	Non-glandular stomach - mucosa coated with gold material Small intestine - dark green contents Adrenal - discoloration, pale red, bilateral External surface - dark green material, perianal region
AG9281*	F	Non-glandular stomach - mucosa colored gold Cecum - contents thick and green External surface - green discoloration of fur, perianal area
AG9282*	F	Non-glandular stomach - colored gold Cecum - thick, green contents External surface - green discoloration, perianal area
AG9283*	F	Stomach - dark contents Glandular stomach - discoloration, solitary, pale red, on mucosa Intestine - dark contents Liver - discoloration, diffuse, pale Skin - discoloration, diffuse, red, base of tail External surface - dark green material, perianal region

*Animal found dead prior to final sacrifice.

TABLE 43 (continued)

INDIVIDUAL NECROPSY FINDINGS

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 3548 mg/kg

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
AG9243*	M	Non-glandular stomach - mucosa covered with gold material Glandular stomach - mucosa smooth; discoloration, diffuse, red, mucosa Small intestine - dark contents External surface - dark material, perianal region
AG9244	M	Kidney - discoloration, diffuse, dark green, bilateral Skin - crusted black ulceration, base of tail Tail - tip black
AG9245*	M	Stomach - mucosal surface coated with gold material Small intestine - dark contents Cecum - discoloration, diffuse, red External surface - dark green material, perianal region
AG9246*	M	Stomach - distended by green metallic flakes Small intestine - hyperemia Colon - hyperemia External surface - green discoloration of fur, perianal region
AG9247*	M	Non-glandular stomach - mucosa covered with gold material Glandular stomach - mucosa smooth Small intestine - dark contents External surface - dark material, perianal region

*Animal found dead prior to final sacrifice.

TABLE 43 (continued)

INDIVIDUAL NECROPSY FINDINGS

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

DOSE GROUP: 3548 mg/kg

Animal Number	Sex	Abnormalities Noted at Necropsy (Organ - Abnormality)
AG9269*	F	Non-glandular stomach - mucosa covered with gold material Glandular stomach - mucosa smooth; discoloration, diffuse, red, mucosa Small intestine - dark contents Cecum - discoloration, diffuse, dark Colon - discoloration, diffuse, red External surface - goldish-dark material, perianal region
AG9270*	F	Small intestine - dark green contents Cecum - contents green/gold External surface - dark green material, perianal region
AG9271*	F	Non-glandular stomach - mucosa covered with gold material Glandular stomach - discoloration, diffuse, red Small intestine - dark green contents Cecum - dark green contents External surface - dark green material, perianal region
AG9272	F	None
AG9273*	F	Non-glandular stomach - mucosa covered with gold material Glandular stomach - mucosa smooth; discoloration, diffuse, red, mucosa Small intestine - dark contents External surface - goldish - dark material, perianal region

*Animal found deal prior to final sacrifice.

TABLE 44

LITCHFIELD-WILCOXON LD50 FOR MALES

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

Dose (mg/kg)	Observed Deaths Proportion	Observed Deaths Percent	Expected Deaths Percent	Difference
891.0	0/5	0.0(10.5)	19.4	-9.0
1413.0	3/5	60.0	43.1	16.9
2239.0	4/5	80.0	69.6	10.4
3548.0	4/5	80.0	88.5	-8.5

Total number of animals: 20

Note - The values in parentheses are those used by the Litchfield-Wilcoxon method to compute Chi Square contributions.

Calculated Chi Square: 1.459

Critical Chi Square (P=.05) for 2 degrees of freedom: 5.99

The data are not significantly heterogeneous.

Calculated LD-50: 1588.6 mg/kg

95% CONFIDENCE LIMITS: 984.9 - 2562.3 mg/kg

The confidence limits are within 61.3% of the LD-50.

Slope: 3.44 (probits/log dose)

There are 15 animals included in groups with expected deaths between 16% (LD-16 = 814.1 mg/kg and 84% (LD-84 = 3099.6 mg/kg).

Given the slope calculated from the present data, a total of 104 animals would be needed in groups with expected deaths between 16% and 84% in order to get the confidence limits within 20% of the LD-50. However, adding more test groups may change the value of the slope.

TABLE 45

LITCHFIELD-WILCOXON LD50 FOR FEMALES

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

Dose (mg/kg)	Observed Deaths Proportion	Observed Deaths Percent	Expected Deaths Percent	Difference
891.0	0/5	0.0(6.3)	11.3	-5.0
1413.0	2/5	40.0	36.5	3.5
2239.0	5/5	100.0(90.3)	70.0	20.4
3548.0	4/5	80.0	91.8	-11.8

Total number of animals: 20

Note - The values in parentheses are those used by the Litchfield-Wilcoxon method to compute Chi Square contributions.

Calculated Chi Square: 2.056

Critical Chi Square (P=.05) for 2 degrees of freedom: 5.99

The data are not significantly heterogeneous.

Calculated LD-50: 1696.1 mg/kg

95% CONFIDENCE LIMITS: 1065.3 - 2700.5 mg/kg

The confidence limits are within 59.2% of the LD-50.

Slope: 4.34 (probits/log dose)

There are 10 animals included in groups with expected deaths between 16% (LD-16 = 997.4 mg/kg and 84% (LD-84 = 2884.3 mg/kg).

Given the slope calculated from the present data, a total of 66 animals would be needed in groups with expected deaths between 16% and 84% in order to get the confidence limits within 20% of the LD-50. However, adding more test groups may change the value of the slope.

TABLE 46

LITCHFIELD-WILCOXON LD50 FOR COMBINED SEXES

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

Dose (mg/kg)	Observed Deaths Proportion	Observed Deaths Percent	Expected Deaths Percent	Difference
891.0	0/10	0.0(10.3)	17.7	-7.4
1413.0	5/10	50.0	43.5	6.5
2239.0	9/10	90.0	72.4	17.6
3548.0	8/10	80.0	91.2	-11.2

Total number of animals: 40

Note - The values in parentheses are those used by the Litchfield-Wilcoxon method to compute Chi Square contributions.

Calculated Chi Square: 3.673

Critical Chi Square (P=.05) for 2 degrees of freedom: 5.99

The data are not significantly heterogeneous.

Calculated LD-50: 1561.2 mg/kg

95% CONFIDENCE LIMITS: 1149.1 - 2121.2 mg/kg

The confidence limits are within 35.9% of the LD-50.

Slope: 3.80 (probits/log dose)

There are 30 animals included in groups with expected deaths between 16% (LD-16 = 851.6 mg/kg and 84% (LD-84 = 2862.2 mg/kg).

Given the slope calculated from the present data, a total of 85 animals would be needed in groups with expected deaths between 16% and 84% in order to get the confidence limits within 20% of the LD-50. However, adding more test groups may change the value of the slope.

FIGURE E-1: DOSE-RESPONSE CURVE FOR MALES

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER

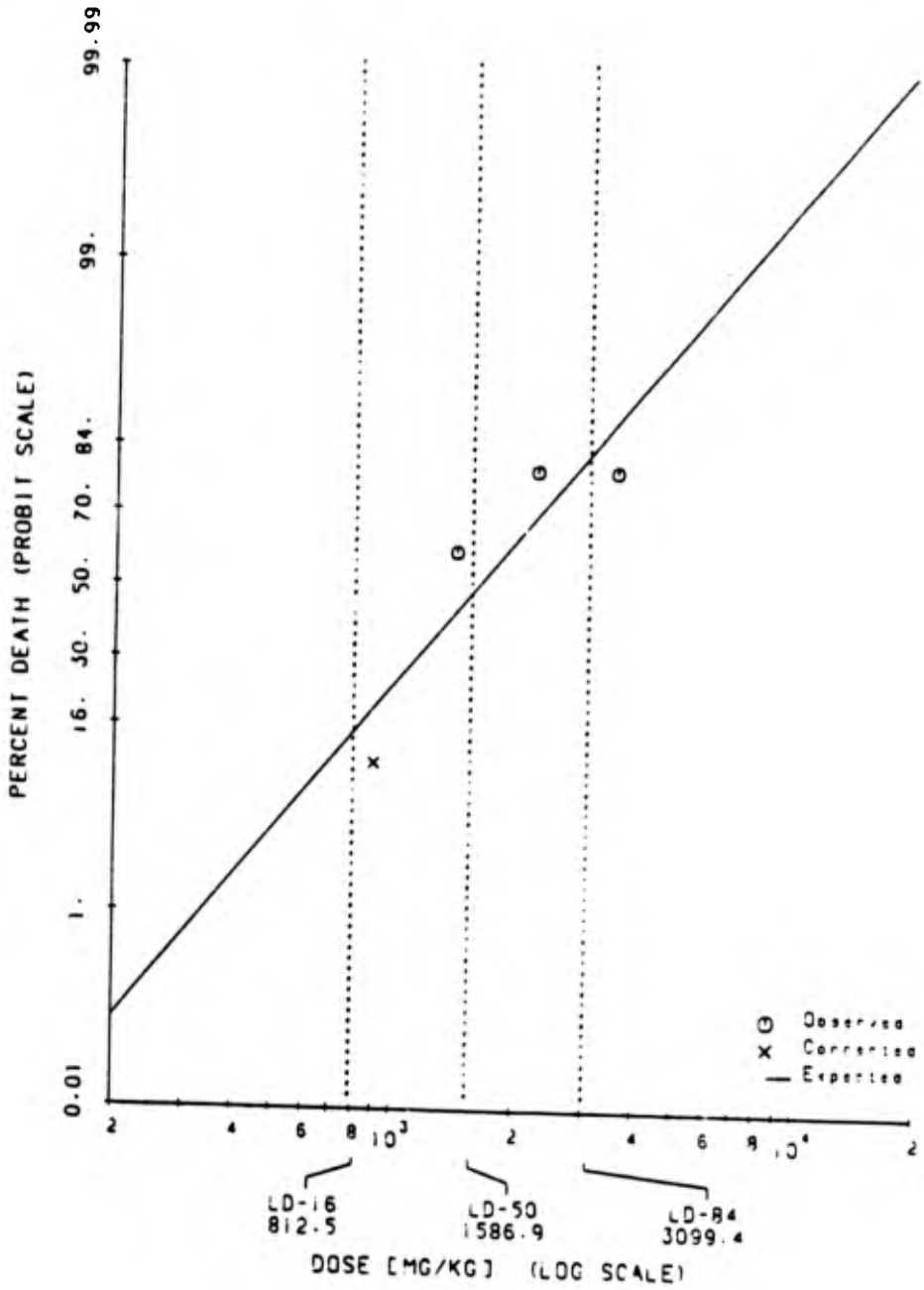


FIGURE E-2: DOSE-RESPONSE CURVE FOR FEMALES

ACUTE ORAL LD5Ø STUDY IN RATS

TEST ARTICLE: BRASS POWDER

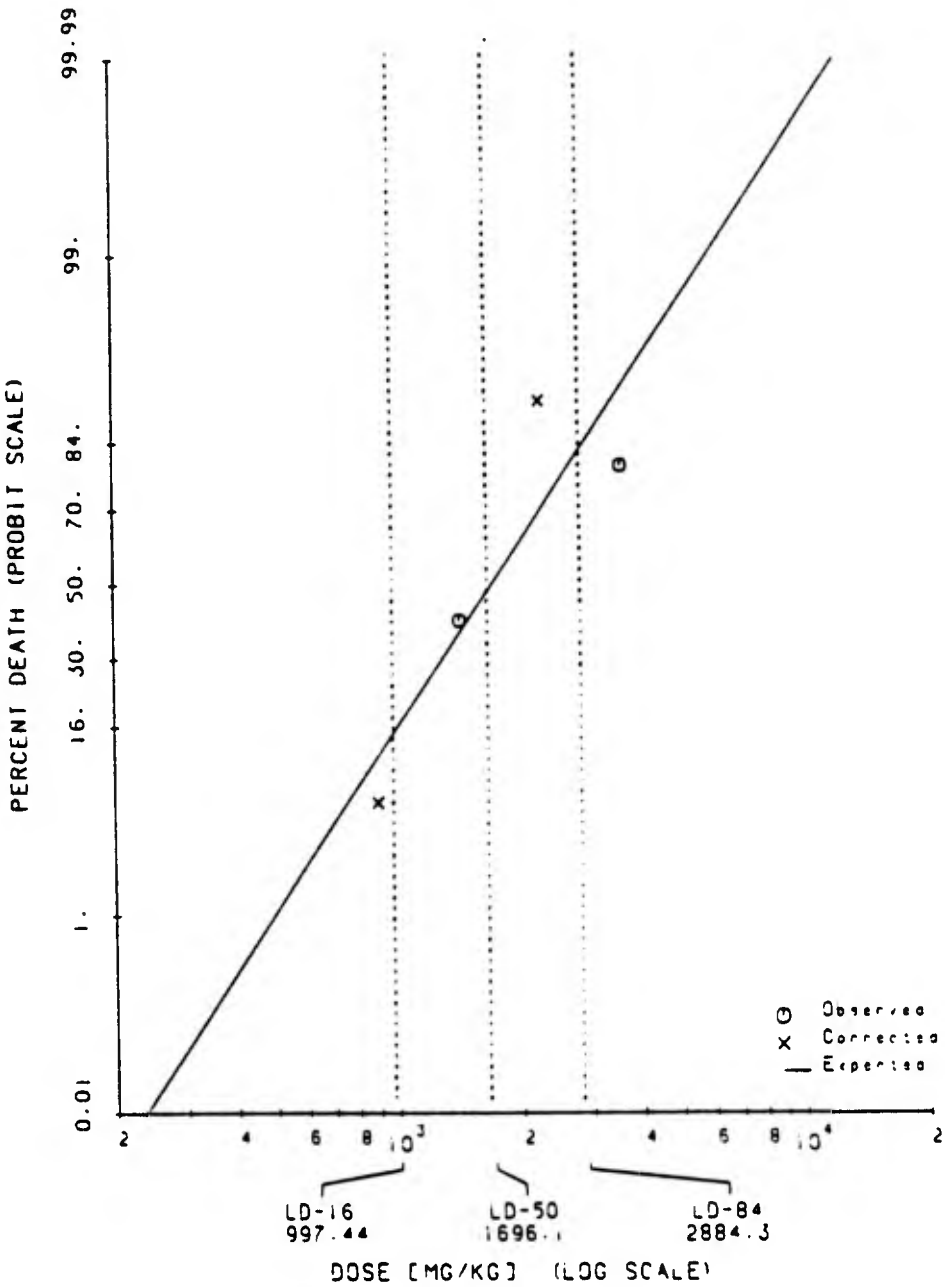
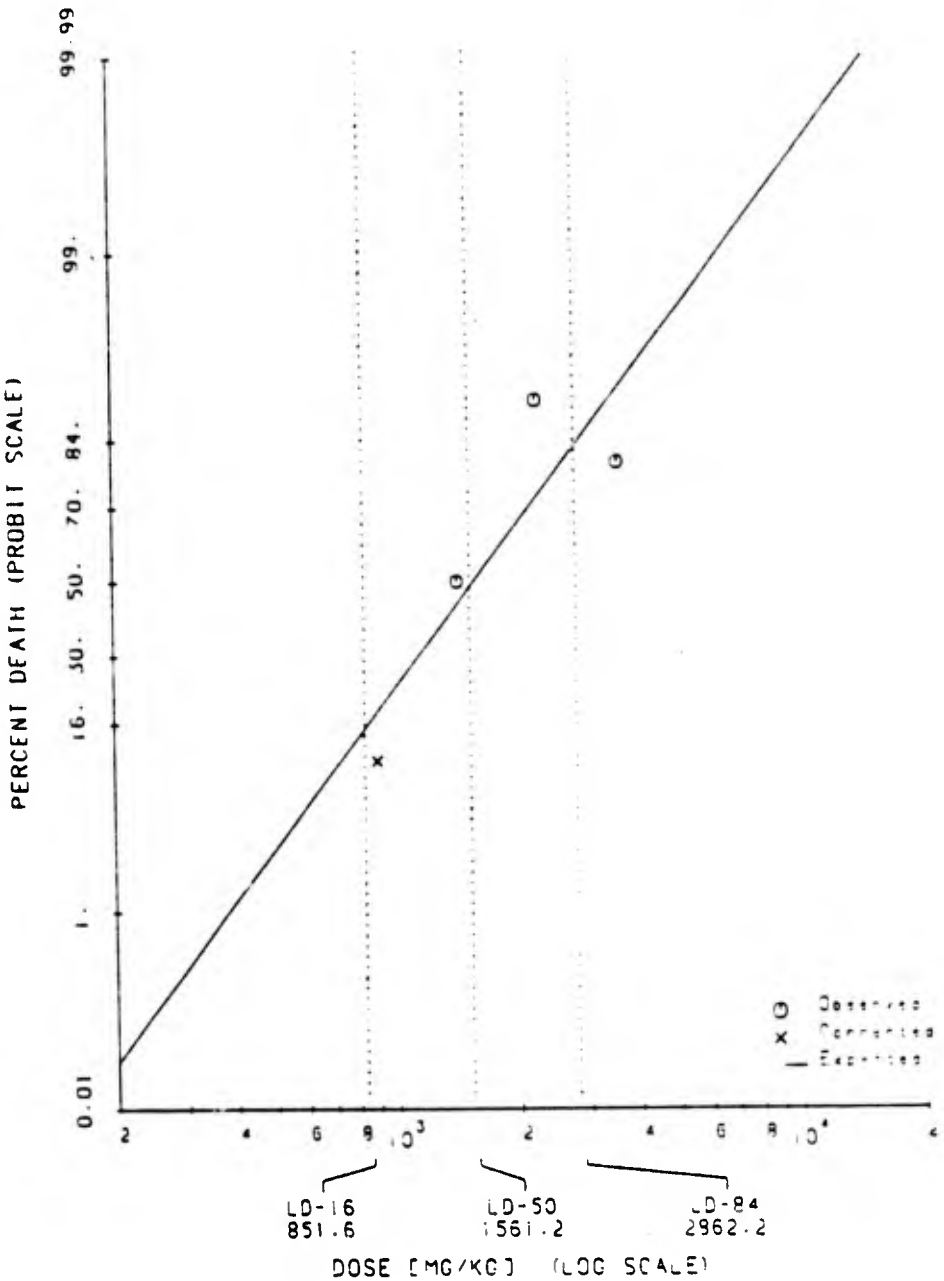


FIGURE E-3: DOSE-RESPONSE CURVE FOR COMBINED SEXES

ACUTE ORAL LD50 STUDY IN RATS

TEST ARTICLE: BRASS POWDER



Appendix A

Quality Assurance Inspections and Audits

QUALITY ASSURANCE INSPECTIONS AND AUDITS

Study Number	Parameter	Date(s) Conducted Start	Finish	Date Reported to Management
410-2133	Status report	6/20/85	6/20/85	6/20/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2134	Status report	6/20/85	6/20/85	6/20/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2135	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2136	Status report	6/24/85	6/24/85	6/24/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2137	Status report	6/20/85	6/20/85	6/20/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2138	Status report	6/20/85	6/20/85	6/20/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2139	Status report	7/01/85	7/01/85	7/01/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2140	Status report	6/20/85	6/20/85	6/20/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86

QUALITY ASSURANCE INSPECTIONS AND AUDITS (continued)

Study Number	Parameter	Date(s) Conducted Start	Finish	Date Reported to Management
410-2141	Status report	6/18/85	6/18/85	6/18/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2142	Status report	6/20/85	6/20/85	6/20/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2143	Status report	7/01/85	7/01/85	7/01/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2144	Status report	6/18/85	6/18/85	6/18/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2145	Status report	6/18/85	6/18/85	6/18/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2146	Status report	6/18/85	6/18/85	6/18/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2147	Status report	7/01/85	7/01/85	7/01/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2148	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86

QUALITY ASSURANCE INSPECTIONS AND AUDITS (continued)

Study Number	Parameter	Date(s) Conducted Start	Finish	Date Reported to Management
410-2149	Status report	6/18/85	6/18/85	6/18/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2150	Status report	6/18/85	6/18/85	6/18/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2151	Status report	7/01/85	7/01/85	7/01/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86
410-2152	Status report	6/18/85	6/18/85	6/18/85
	Data	12/10/85	12/16/85	12/17/85
	Draft report	12/10/85	12/16/85	12/17/85
	Draft report	6/04/86	6/04/86	6/05/86
	Final report	9/03/86	9/03/86	9/03/86

APPENDIX B

GRADING SYSTEM FOR EVALUATION OF DERMAL REACTIONS

APPENDIX B

GRADING SYSTEM FOR EVALUATION OF DERMAL REACTIONS+

(1) Erythema and Eschar Formation

No erythema	Ø
Very slight erythema (barely perceptible)	1
Well defined erythema	2
Moderate to severe erythema	3
Severe erythema (beet redness) to slight eschar formation (injuries in depth)	4
Total possible erythema score	4

(2) Edema Formation

No edema	Ø
Very slight edema (barely perceptible)	1
Slight edema (edges of area well defined by definite raising)	2
Moderate edema (raised approximately 1 mm)	3
Severe edema (raised more than 1 mm and extending beyond area of exposure)	4
Total possible edema score	4

Other dermal reactions observed were also recorded.

+ Draize, J. H., "Appraisal of the Safety of Chemicals in Foods, Drugs, and Cosmetics", The Association of Food and Drug Officials of the United States, Fourth Printing, 1979, p. 48.

APPENDIX C

GRADING SYSTEM FOR EVALUATION OF EYE IRRITATION

APPENDIX C

GRADING SYSTEM FOR EVALUATION OF EYE IRRITATION+

I. Cornea

A. Opacity-Degree of Density (area most dense taken for reading)

No opacity	0
Scattered or diffuse area, details of iris clearly visible	(1)*
Easily discernible translucent areas, details of iris slightly obscured	2
Opalescent areas, no details of iris visible, size of pupil barely discernible	3
Opaque, iris invisible	4

B. Area of Cornea Involved

One-quarter (or less) but not zero	1
Greater than one-quarter, but less than one-half	2
Greater than one-half, but less than three-quarters	3
Greater than three-quarters, up to whole area	4

A x B x 5 Total Maximum = 80

II. Iris

A. Values

Normal	0
Folds above normal, congestion, swelling, circumcorneal injection (any or all of these or combination of any thereof) iris still reacting to light (sluggish reaction is positive)	(1)*
No reaction to light, hemorrhage, gross destruction (any or all of these)	2

A x 5 Total Maximum = 10

III. Conjunctivae

A. Redness (refers to palpebral and bulbar conjunctivae excluding cornea and iris)

Vessels normal	0
Vessels definitely injected above normal	1
More diffuse, deeper crimson red, individual vessels not easily discernible	(2)*
Diffuse beefy red	3

APPENDIX C

GRADING SYSTEM FOR EVALUATION OF EYE IRRITATION+

B. Chemosis

No swelling	0
Any swelling above normal (includes nictitating membrane)	1
Obvious swelling with partial eversion of the lids	(2)*
Swelling with lids about half closed	3
Swelling with lids about half closed to completely closed.	4

C. Discharge

No discharge	0
Any amount different from normal (does not include small amount observed in inner canthus of normal animals)	1
Discharge with moistening of the lids and hairs just adjacent to the lids	2
Discharge with moistening of the lids and considerable area around the eye	3

(A + B + C) x 2 Total Maximum = 20

Total Possible Score = I + II + III = 110

IV. Fluorescein Stain Retention: Not in the Draize Table and not included in the Primary Eye Irritation Scores. Any stain retention was considered to be epithelial swelling/erosion and not true stromal opacity.

Area of Cornea Involved

None	0
One-quarter (or less) but not zero	1
Greater than one-quarter, but less than one-half	2
Greater than one-half, but less than three-quarters	3
Greater than three-quarters, up to whole area	4

* Bracketed figures indicate lowest grades considered positive.

+ Draize, J. H., "Appraisal of the Safety of Chemicals in Foods, Drugs, and Cosmetics", The Association of Food and Drug Officials of the United States, Fourth Printing, 1979, p. 51.

APPENDIX D

PATHOLOGY REPORTS

Key:

AMERICAN BIOGENICS STUDY NO.	TEST ARTICLE
410-2135	Brass Powder
410-2139	Fog Oil
410-2143	Diesel Fuel
410-2147	Fog Oil and Brass Powder
410-2151	Diesel Fuel and Brass Powder

AMERICAN BIOGENICS CORPORATION STUDY 410-2135

ACUTE DERMAL TOXICITY STUDY IN RABBITS

PATHOLOGY REPORT

Submitted To:

American Biogenics Corporation
1800 E. Pershing Road
Decatur, IL 62526

Submitted By:

Experimental Pathology Laboratories, Inc.
1800 E. Pershing Road
Decatur, IL 62526

July 3, 1985

QUALITY ASSURANCE
REPORT CERTIFICATION

Client Name: American Biogenics Corporation

Client Study Number: 410-2135

Study Director: Dr. W.O. Iverson

Pathologist: Dr. S.V. Becker

Study Title: Acute Dermal Toxicity Study in Rabbits

Test Article: Particulate SBP #14*

Species: New Zealand White Rabbit

All parts of the pathology phase of this study, including the final report, were reviewed by Experimental Pathology Laboratories Quality Assurance Unit on July 2 and 3, 1985. All findings were reported to the Study Director and Management.

Betty L. Plankenhorn

Betty L. Plankenhorn

July 3, 1985

*Brass Powder

83 6-5-86

AMERICAN BIOGENICS CORPORATION STUDY 410-2135

ACUTE DERMAL TOXICITY STUDY IN RABBITS

PATHOLOGY SUMMARY

Microscopic examinations were performed on single sections of treated and untreated skin from two male and two female New Zealand White Rabbits (Oryctolagus cuniculus) sacrificed on study day fourteen.

All animals were from a study consisting of a single group of rabbits and designed to evaluate the acute dermal toxicity of Particulate SBP #14* when applied topically for a single 24 hour period.

Tissue harvesting, fixation, trimming, processing, and staining with hematoxylin and eosin were by standard methods. The tissues were prepared and examined by Experimental Pathology Laboratories, Inc.

RESULTS

All diagnoses are presented in the Histopathology Incidence Tables. A correlation, where possible, of abnormalities observed at necropsy with the corresponding microscopic observation is presented in the Correlation of Gross and Microscopic Findings Tables.

Treated skin from one male had mild dermal edema and fragmentation of collagen and the other male had minimal hyperkeratosis and focal keratotic entrapment of the test material and debris. All the untreated skin specimens and the treated skin from both female rabbits were judged to be unremarkable.

Stephen V. Becker, D.V.M.
3 July 1985

*Brass Powder

83 6-5-86

HISTOPATHOLOGY INCIDENCE TABLE

STUDY NUMBER 410-2135

ACUTE DERMAL TOXICITY
STUDY IN RABBITS

ANIMAL NUMBER	BB8896-Male	BB8899-Male			BB8951-Female	BB8952-Female
SKIN-TREATED					X	X
Edema, Dermis	2					
Fragmentation, Collagen	2					
Hyperkeratosis		1				
Cutaneous Keratotic Cyst(s)		1				
SKIN-UNTREATED CONTROL	X	X			X	X

Key P = Present N = No Section A = Autolysis X = Not Remarkable
1 = Minimal 2 = Slight 3 = Moderate 4 = Moderately Severe/High

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS

Species: Rabbit Study Number: 410-2135 Dosage Level: 2 gm/kg

Animal Number	Client's Tissue Identification	Client's Gross Observations	Microscopic Observations
BB8899-M	SKIN-TREATED	Discoloration, Diffuse, Dark Green	No Corollary Change Detected

AMERICAN BIOGENICS CORPORATION STUDY 410-2139

ACUTE DERMAL TOXICITY STUDY IN RABBITS

PATHOLOGY REPORT

Submitted To:

American Biogenics Corporation
1800 E. Pershing Road
Decatur, IL 62526

Submitted By:

Experimental Pathology Laboratories, Inc.
1800 E. Pershing Road
Decatur, IL 62526

July 3, 1985

QUALITY ASSURANCE
REPORT CERTIFICATION

Client Name: American Biogenics Corporation

Client Study Number: 410-2139

Study Director: Dr. W.O. Iverson

Pathologist: Dr. S.V. Becker

Study Title: Acute Dermal Toxicity Study in Rabbits

Test Article: Fog Oil

Species: New Zealand White Rabbit

All parts of the pathology phase of this study, including the final report, were reviewed by Experimental Pathology Laboratories Quality Assurance Unit on July 2 and 3, 1985. All findings were reported to the Study Director and Management.

Betty L. Plankenhorn

Betty L. Plankenhorn

July 3, 1985

AMERICAN BIOGENICS CORPORATION STUDY 410-2139

ACUTE DERMAL TOXICITY STUDY IN RABBITS

PATHOLOGY SUMMARY

Microscopic examinations were performed on single sections of treated and untreated skin from two male and two female New Zealand White Rabbits (Oryctolagus cuniculus) sacrificed on study day fourteen.

All animals were from a study consisting of a single group of rabbits and designed to evaluate the acute dermal toxicity of Fog Oil when applied topically for a single 24 hour period.

Tissue harvesting, fixation, trimming, processing, and staining with hematoxylin and eosin were by standard methods. The tissues were prepared and examined by Experimental Pathology Laboratories, Inc.

RESULTS

All diagnoses are presented in the Histopathology Incidence Tables. A correlation, where possible, of abnormalities observed at necropsy with the corresponding microscopic observation is presented in the Correlation of Gross and Microscopic Findings Tables.

Mild to moderate responses to irritation characterized by acanthosis, hyperkeratosis, and an acute inflammatory infiltrate of the dermis was seen in the treated skin of both male rabbits. All the untreated skin specimens and the treated skin from both female rabbits were judged to be unremarkable.

Stephen V. Becker, D.V.M.

3 July 1985

HISTOPATHOLOGY INCIDENCE TABLE

STUDY NUMBER 410-2139

ACUTE DERMAL TOXICITY
STUDY IN RABBITS

ANIMAL NUMBER	BB8886-Male	BB8887-Male			BB8937-Female	BB8941-Female
SKIN-TREATED					X	X
Acanthosis	3	2				
Hyperkeratosis	3	2				
Acute Inflammatory Infiltrate, Dermis	2	2				
SKIN-UNTREATED CONTROL	X	X			X	X

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS

Species: Rabbit Study Number: 410-2139 Dosage Level: 2 gm/kg

Animal Number	Client's Tissue Identification	Client's Gross Observations	Microscopic Observations
BB8886-M	SKIN-TREATED	Fur Slightly Crusted	Acanthosis/Hyperkeratosis
BB8937-F	SKIN-TREATED	Discoloration, Multiple Focal, Red	No Corollary Change Detected

AMERICAN BIOGENICS CORPORATION STUDY 410-2143

ACUTE DERMAL TOXICITY STUDY IN RABBITS

PATHOLOGY REPORT

Submitted To:

American Biogenics Corporation
1800 E. Pershing Road
Decatur, IL 62526

Submitted By:

Experimental Pathology Laboratories, Inc.
1800 E. Pershing Road
Decatur, IL 62526

July 3, 1985

QUALITY ASSURANCE
REPORT CERTIFICATION

Client Name: American Biogenics Corporation

Client Study Number: 410-2143

Study Director: Dr. W.O. Iverson

Pathologist: Dr. S.V. Becker

Study Title: Acute Dermal Toxicity Study in Rabbits

Test Article: Diesel Fuel

Species: New Zealand White Rabbit

All parts of the pathology phase of this study, including the final report, were reviewed by Experimental Pathology Laboratories Quality Assurance Unit on July 2 and 3, 1985. All findings were reported to the Study Director and Management.

Betty L. Plankenhorn

Betty L. Plankenhorn

July 3, 1985

AMERICAN BIOGENICS CORPORATION STUDY 410-2143

ACUTE DERMAL TOXICITY STUDY IN RABBITS

PATHOLOGY SUMMARY

Microscopic examinations were performed on single sections of treated and untreated skin from two male and two female New Zealand White Rabbits (Oryctolagus cuniculus) sacrificed on study day fourteen, and one male rabbit found dead on test day thirteen.

All animals were from a study consisting of a single group of rabbits and designed to evaluate the acute dermal toxicity of Diesel Fuel when applied topically for a single 24 hour period.

Tissue harvesting, fixation, trimming, processing, and staining with hematoxylin and eosin were by standard methods. The tissues were prepared and examined by Experimental Pathology Laboratories, Inc.

RESULTS

All diagnoses are presented in the Histopathology Incidence Tables. A correlation, where possible, of abnormalities observed at necropsy with the corresponding microscopic observation is presented in the Correlation of Gross and Microscopic Findings Tables.

Minimal to marked changes were found in all the treated skin specimens. Hyperkeratosis was seen in 5/5, acanthosis in 4/5, acute dermatitis in 4/5, and abscesses or microabscesses in 2/5 of the rabbits. All the untreated skin specimens were judged to be unremarkable.

Stephen V. Becker, D.V.M.

3 July 1985

HISTOPATHOLOGY INCIDENCE TABLE

STUDY NUMBER 410-2143

ACUTE DERMAL TOXICITY
STUDY IN RABBITS

ANIMAL NUMBER	BB9030-Male*			BB9027-Male	BB9028-Male			BB9053-Female	BB9054-Female																						
SKIN-TREATED																															
Acanthosis	1			1				3	3																						
Hyperkeratosis	2			2	1			3	2																						
Abscess	4																														
Microabscess, Dermis/Epidermis	2								4																						
Acute Inflammatory Infiltrate, Dermis	1			1				1	2																						
Superficial Crusting	2			2	1																										
Hemorrhage, Dermis								1																							
SKIN-UNTREATED CONTROL	X			X	X			X	X																						

*Found Dead

Key P = Present N = No Section A = Autolysis X = Not Remarkable

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS

Species: Rabbit Study Number: 410-2143 Dosage Level: 2 gm/kg

Animal Number	Client's Tissue Identification	Client's Gross Observations	Microscopic Observations
BB9030-M*	SKIN-TREATED	Thickened, Mild	Acanthosis/Hyperkeratosis
	SKIN-TREATED	Discoloration, Tan, Crusted	Abscess
	SKIN-TREATED	Abscess	Abscess
	EXTERNAL SURFACE	Dried Fecal Material, Perianal Region	No Section
	STOMACH	Distended With Gas And Fluid	No Section
	STOMACH	Discoloration, Multiple Focal, Black,	
		On Mucosa	No Section
	CECUM	Distended With Gas	No Section
	INTESTINE	Mucoid And Fluid Contents	No Section
BB9027-M	SKIN-TREATED	Thickened, Mild	Acanthosis/Hyperkeratosis
	SKIN-TREATED	Crusted, Tan, Mild	Superficial Crusting
BB9028-M	SKIN-TREATED	Crusted, Tan, Mild	Superficial Crusting
BB9053-F	SKIN-TREATED	Thickened, Mild	Acanthosis/Hyperkeratosis
	SKIN-TREATED	Crusted, Red Tan, Mild	Hyperkeratosis

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS

Species: Rabbit Study Number: 410-2143 (Continued) Dosage Level: 2 gm/kg

Animal Number	Client's Tissue Identification	Client's Gross Observations	Microscopic Observations
BB9054-F	SKIN-TREATED	Thickened, Mild	Acanthosis/Hyperkeratosis
	SKIN-TREATED	Crusted, Tan, Mild	Hyperkeratosis
	SKIN-TREATED	Scab, Solitary, Red Tan	No Corollary Change Detected

AMERICAN BIOGENICS CORPORATION STUDY 410-2147

ACUTE DERMAL TOXICITY STUDY IN RABBITS

PATHOLOGY REPORT

Submitted To:

American Biogenics Corporation
1800 E. Pershing Road
Decatur, IL 62526

Submitted By:

Experimental Pathology Laboratories, Inc.
1800 E. Pershing Road
Decatur, IL 62526

July 3, 1985

QUALITY ASSURANCE
REPORT CERTIFICATION

Client Name: American Biogenics Corporation

Client Study Number: 410-2147

Study Director: Dr. W.O. Iverson

Pathologist: Dr. S.V. Becker

Study Title: Acute Dermal Toxicity Study in Rabbits

Test Article: Fog Oil and Particulate SBP #14*

Species: New Zealand White Rabbit

All parts of the pathology phase of this study, including the final report, were reviewed by Experimental Pathology Laboratories Quality Assurance Unit on July 2 and 3, 1985. All findings were reported to the Study Director and Management.

Betty L. Plankenhorn

Betty L. Plankenhorn

July 3, 1985

*Brass Powder

BB 6-5-86

AMERICAN BIOGENICS CORPORATION STUDY 410-2147

ACUTE DERMAL TOXICITY STUDY IN RABBITS

PATHOLOGY SUMMARY

Microscopic examinations were performed on single sections of treated and untreated skin from two male and two female New Zealand White Rabbits (Oryctolagus cuniculus) sacrificed on study day fourteen.

All animals were from a study consisting of a single group of rabbits and designed to evaluate the acute dermal toxicity of Fog Oil and Particulate SBP #14*when applied topically for a single 24 hour period.

Tissue harvesting, fixation, trimming, processing, and staining with hematoxylin and eosin were by standard methods. The tissues were prepared and examined by Experimental Pathology Laboratories, Inc.

RESULTS

All diagnoses are presented in the Histopathology Incidence Tables. A correlation, where possible, of abnormalities observed at necropsy with the corresponding microscopic observation is presented in the Correlation of Gross and Microscopic Findings Tables.

Mild to moderate hyperkeratosis accompanied by minimal acanthosis and acute dermatitis was seen in the treated skin specimens from both male rabbits. Similar but less severe lesions were seen in both the female rabbits. All the untreated skin specimens were judged to be unremarkable.

Stephen V. Becker, D.V.M.

3 July 1985

*Brass Powder

83 6-5-86

HISTOPATHOLOGY INCIDENCE TABLE

STUDY NUMBER 410-2147

ACUTE DERMAL TOXICITY
STUDY IN RABBITS

ANIMAL NUMBER	BB8891-Male	BB8892-Male			BB8945-Female	BB8946-Female
SKIN-TREATED						
Hyperkeratosis	3	2			1	1
Acanthosis	1	1			1	
Microabscess, Dermis	1					
Acute Inflammatory Infiltrate, Dermis	1	1				
Superficial Crusting					1	
SKIN-UNTREATED CONTROL	X	X			X	X

Key P = Present N = No Section A = Autolysis X = Not Remarkable

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS

Species: Rabbit Study Number: 410-2147 Dosage Level: 2 gm/kg

Animal Number	Client's Tissue Identification	Client's Gross Observations	Microscopic Observations
BB8891-M	SKIN-TREATED	Thickened, Mild	Acanthosis/Hyperkeratosis
	SKIN-TREATED	Discoloration, Diffuse, Tan, With	
		Slight Crusting	Hyperkeratosis
BB8945-F	SKIN-TREATED	Discoloration, Diffuse, Dark Green	No Corollary Change Detected
BB8946-F	SKIN-TREATED	Discoloration, Dark Green, Faint,	
		Scattered	No Corollary Change Detected

AMERICAN BIOGENICS CORPORATION STUDY 410-2151

ACUTE DERMAL TOXICITY STUDY IN RABBITS

PATHOLOGY REPORT

Submitted To:

American Biogenics Corporation
1800 E. Pershing Road
Decatur, IL 62526

Submitted By:

Experimental Pathology Laboratories, Inc.
1800 E. Pershing Road
Decatur, IL 62526

July 3, 1985

QUALITY ASSURANCE
REPORT CERTIFICATION

Client Name: American Biogenics Corporation

Client Study Number: 410-2151

Study Director: Dr. W.O. Iverson

Pathologist: Dr. S.V. Becker

Study Title: Acute Dermal Toxicity Study in Rabbits

Test Article: Diesel Fuel and Particulate SBP #14*

Species: New Zealand White Rabbit

All parts of the pathology phase of this study, including the final report, were reviewed by Experimental Pathology Laboratories Quality Assurance Unit on July 2 and 3, 1985. All findings were reported to the Study Director and Management.

Betty L. Plankenhorn

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July 3, 1985

*Brass Powder

B 6-5-86

AMERICAN BIOGENICS CORPORATION STUDY 410-2151

ACUTE DERMAL TOXICITY STUDY IN RABBITS

PATHOLOGY SUMMARY

Microscopic examinations were performed on single sections of treated and untreated skin from two male and two female New Zealand White Rabbits (Oryctolagus cuniculus) sacrificed on study day fourteen.

All animals were from a study consisting of a single group of rabbits and designed to evaluate the acute dermal toxicity of Diesel Fuel and Particulate SBP #14*when applied topically for a single 24 hour period.

Tissue harvesting, fixation, trimming, processing, and staining with hematoxylin and eosin were by standard methods. The tissues were prepared and examined by Experimental Pathology Laboratories, Inc.

RESULTS

All diagnoses are presented in the Histopathology Incidence Tables. A correlation, where possible, of abnormalities observed at necropsy with the corresponding microscopic observation is presented in the Correlation of Gross and Microscopic Findings Tables.

Minimal to mild hyperkeratosis and acanthosis were diagnosed in all the treated skin specimens. Minimal dermal edema and acute dermatitis were seen in one male and one female rabbit, respectively. All the untreated skin specimens were judged to be unremarkable.

Stephen V. Becker, D.V.M.

3 July 1985

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HISTOPATHOLOGY INCIDENCE TABLE

STUDY NUMBER 410-2151

ACUTE DERMAL TOXICITY
STUDY IN RABBITS

ANIMAL NUMBER	BB9033-Male	BB9035-Male			BB9062-Female	BB9063-Female
SKIN-TREATED						
Edema, Dermis	1					
Hyperkeratosis	2	1			2	2
Acanthosis	1	1			1	2
Superficial Crusting	1					
Cutaneous Keratotic Cyst(s)		2				
Acute Inflammatory Infiltrate, Dermis						1
SKIN-UNTREATED CONTROL	X	X			X	X

Key P = [illegible] N = No Section A = Autolysis X = Not Rem[illegible]

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS

Species: Rabbit Study Number: 410-2151 Dosage Level: 2 gm/kg

Animal Number	Client's Tissue Identification	Client's Gross Observations	Microscopic Observations
BB9033-M	SKIN-TREATED	Discoloration, Diffuse, Red	No Corollary Change Detected
	SKIN-TREATED	Discoloration, Multiple Focal, Red	No Corollary Change Detected
	SKIN-TREATED	Crusted, Tan, Mild	Superficial Crusting
BB9035-M	SKIN-TREATED	Crusted, Dark Green, Mild	Hyperkeratosis
	SKIN-TREATED	Discoloration, Red, Focal	No Corollary Change Detected
	LUNG	Discoloration, Multiple Focal, Red	No Section
BB9062-F	SKIN-TREATED	Crusted, Tan, Mild	Hyperkeratosis
BB9063-F	SKIN-TREATED	Crusted, Tan, Mild	Hyperkeratosis

APPENDIX E

COMPOSITION OF BRASS POWDER

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Ingredient	(ppm)
Ag	20
Al	2500-3300
B	95
Ba	6
Be	0.5
Ca	20
Cd	40
Co	2.5
Cs	10
Ga	<150
K	680
Mg	7
Mn	15-25
Na	30
Ni	60
Si	275
Sr	<0.1
Ti	30
V	4
Zr	5
As	3
Li	2
Fe	<100-245
Pb	134
Hg	0.007
Cu	72-69%
Zn	27-20%
Se	<5
Sb	5
Ta	<0.01
Cl	2%

This information was supplied by the Sponsor.

APPENDIX F

LIST OF PERSONNEL

PERSONNEL

American Biogenics personnel listed below participated in the conduct and/or report preparation of these studies:

Gary L. Doyle, B.S.	Acute Department, Technician
Jonathan C. Kreuger, B.A.	Acute Department, Technician
Kathy Mellon, M.S.	Acute Department, Technician
Sandra H. Smith	Acute Department, Project Supervisor
Dale A. Mayhew, Ph.D.	Director, Toxicology and Principle Investigator
Steven V. Becker, D.V.M.	Experimental Pathology Laboratories, Pathologist
William O. Iverson, D.V.M	Experimental Pathology Laboratories, Director of Pathology Services
Antoinette Skelley	Manager, Quality Assurance, Regulatory Affairs, and Archives

APPENDIX G

DISTRIBUTION LIST

DISTRIBUTION LIST
FINAL REPORTS FOR SMOKE/OBSCURANTS

Number of copies	Address
6	Project Manager for Smoke/Obscurants Bldg. 324 ATTN: AMCPM-SMK-E (Dr. Lock) Aberdeen Proving Ground, MD 21005-5001
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