6-5-90

008955

215B

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

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

50534-115 Tuffcide 404
50534-9 Daconil 2787
50534-8 Bravo 500
50534-188 Bravo 720

MEMORANDUM

SUBJECT: EPA Reg. No./File Symbol

FROM: William S. Woodrow WSW 5-24-90
Precautionary Review Section
Registration Support Branch
Registration Division (H7505C)
E 6/5/90

TO: Lewis / Stone (PM 21)
~~Fungicide - Herbicide Branch~~
Registration Division (H7505C)

APPLICANT: Fermenta ASC Corporation
5966 Heisley Road
P.O. Box 8000
Mentor, Ohio 44061-8000

FORMULATION FROM LABEL:

	-115	
	-9	
	-8	-188
	% by wt.	
Active Ingredient(s):		
Chlorothalonil (tetrachloroisophtalonitrile)	40.4	54.C
Inert Ingredient(s):	59.6	45.C
Total	100.0%	

BACKGROUND

The Fermenta ASC Corp. requested precautionary labeling changes and/or the addition of label use claims for the following chlorothalonil products; whose Confidential Statements of formula are similar enough to utilize a single set of supporting acute toxicity data:

EPA 50534-115	Tuffcide 404	
	chlorothalonil	40-4%
	Inerts	59.6%
50534-9	Daconil 2787	
	chlorothalonil	40.4%
	Inerts	59.6%
50534-8	Bravo 500	
	Chlorothalonil	40.4%
	Inerts	59-6%
50534-188	Bravo 720	54.0%
	Chlorothalonil	46.0%

RECOMMENDATIONS

1) Precautionary labeling change requests:

a. Request to delete "May be a potential skin sensitizer", under "Precautionary Statements" for:

50534-115 Tuffcide 404;
50534-9 Daconil 2787;
50534-8 Bravo 500, and;
50534-188 Bravo 720

RSB/PRS recommendation: This request is not justified. The only dermal sensitization study representing the above four products (conducted using Bravo 720; MRID# 405460-02), showed that Bravo 720 was a weak contact sensitizer.

b. Fermenta Corp. is justified in removing all statements from the following labels refetting to "chlorothalonil.... or this product may produce temporary allergic side effects....", or "Note to physicians: Persons having an allergic reaction respond to treatment with

antihistimines ....."

50534-115 Tuffcide 404
50534-9 Daconil 2787
50534-8 Bravo 500
50534-188 Bravo 720

c. Fermenta Corp. requests adding the following labels: to the 50534-115; 50534-9; 50534-8, and; 50534-188

"Note to Physician: Persons having temporary irritation symptoms may respond to treatment with antihistimines or steroid creams and/or systemic steroids" is acceptable to RSB/PRS. Note to PM: The Fermenta Note To Physician is acceptable provided "may" is inserted into the phraseology suggested by Fermenta.

The "Note to User: this product may produce mild bronchial irritation and temporary irritation of the skin characterized by redness or rash on exposed skin areas. Affected persons

should call a physician", proposed by Fermenta is also acceptable to RSB/PRS, for the following product labels:

50534-115;
50534-9;
50534-8; and;
50534-188

2) The Fermenta Corp. requests permission to add "prevents fungal growth on caulkes, non-food grade sealants and adhesives", to the 50534-115 Tuffcide 404 product label.

The Fermenta Corp. request to add caulks, non-food grade sealants and adhesives to the 50534-115 Tuffcide 404 label is not acceptable to RSB/PRS UNTIL DATA BASE IS COMPLETE & a current acute toxicity profile for 50534-115, as well as for the products listed below follows:

50534-115;
50534-9;
50534-8, and;
50534-188

A current acute toxicity profile for the products listed above consists of:

Acute oral study (Bravo 500; 50534-8, 40.4% A.I.)
#87306, 10-19-77
Tox. Category III Core Guidelines

Acute dermal study (Bravo 500; 50534-8, 40.4% A.I.)
#87307, 10-24-77
Tox. Category IV Core Guidelines

Acute dermal study (Bravo-720; 50534-188, 54.0% A.I.)
#158.404, 2-7-86
Tox. Category III Core Guidelines

Acute inhalation study (Bravo-500; 50534-8, 40.4% A.I.)
#87310, 12-6-77
Tox. Category - not determined Supplementary (no particle size/size distribution; NO-MMAD/GSD. Accuracy of cloud conc. questionable, respirable particle fraction was an inaccurate, crude estimation.

Eye irritation study (Bravo-500; 50534-8, 40.4% A.I.)
87177 4-17-81
Tox. Category II Core Guidelines

Eye irritation study (Bravo-500; 50534-8, 40.4% A.I.)
87177 4-17-81
Tox. Category III Core Guidelines

Eye irritation study (Bravo-500; 50534-8, 40.4% A.I. #87178
Tox. Category III Core Guidelines

Eye irritation study (Bravo 720; 50534-188, 54% A.I.) # WIL-11006
Tox. Category II Core Guidelines

Skin irritation study (Bravo 500; 50534-8
40.4% A.I. #4503-77, 87308
Tox. Category IV Core Guidelines

Dermal sensitization study (Bravo 720; 50534-185
54.0% A.I. # 405460-02
A weak contact sensitizer.
Core Guidelines

LABELING : 50534-115, 50534-9, 50534-8, 50534-188.

1) The WARNING signal word is appropriate.

2) 50534-115 Tuffcide 404

Precautionary Statements

a. Do not remove the "May be a potential skin sensitizer" statement.

Under First Aid:

Add, "If Swallowed: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person."

3) 50534-9 Daconil 2787

Precautionary Statements

a. Do not remove the "May be a potential skin sensitizer" statement.

b. Add "Harmful if swallowed or absorbed through skin, and causes eye injury."

Under First Aid:

Add, "If Swallowed: Call a physician or

Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconcious person.

If on skin: Wash with plenty of soap and water. Get medical attention.

If in eyes: Flush with plenty of water. Call a physician.

4) 50534-8 Bravo 500

Precautionary Statements

a. Do not remove the "May be a potential skin sensitizer" statement.

b. Add: "Harmful if swallowed, absorbed through skin, and causes eye injury."

Under First Aid:

Add: If swallowed: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce

vomiting or give anything by mouth to an unconscious person.

If on skin: Wash with plenty of soap and water. Get medical attention.

5) 50534-188 Bravo 720

Precautionary Statements

a. Do not remove the "May be a potential skin sensitizer" statement.

b. Add "Harmful if swallowed, absorbed through skin, and causes eye injury."

Under First Aid:

Add: If Swallowed: Call a physician or Poison Control Center. Drink 1 or 2 glasses of water and induce vomiting by touching back of throat with finger. Do not induce vomiting or give anything by mouth to an unconscious person.

If on skin: Wash with plenty of soap and water. Get medical attention.

6) Deletion of statements regarding temporary allergic side effects, and Note to Physician as indicated on sample labels provided by the registrant is acceptable to RSB/PRS. The deletion of "Note to User" under Directions for Use (50534-115, 50534-9) is acceptable.

7) The addition of a "Note to Physician", as indicated on sample labels, is acceptable provided the word "may" is inserted between the words ..... symptom and respond ..... "

8) The addition of a "Note to User", as shown on the sample label is acceptable.

9) The label additions shown under 7) and 8) above concern products:

50534-115 ; Tuffcide 404
50534-9 ; Daconil 2787
50534-8, and ; Bravo 500
50534-118 Bravo 720

ADDITIONAL RECOMMENDATION

3) The Registrant must submit an acceptable acute inhalation toxicity study, using one of the following Fermenta products: 50534-115 (Tuffcide 404), or 50534-9 (Daconil 2787), or 50534-8 (Bravo 500).

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

Woodrow

Product Manager: (21)
MRID No.: 87306
Testing Facility: Bio/Dynamics
Author(s): W.E. Rinehart
Species: Rat; Wistar
Age: not stated
Weight: 210-357
Source: Maryland Farms, Md.
Test Material: Compound 8641-125 (Bravo 500); liquid
Quality Assurance (40 CFR §160.12):

Reviewer: ~~M. Waller~~
Report Date: 5-11-88
Report No. 4501-77

00895

Conclusion:

1. LD_{50} (mg/kg): Males = ; Females = ; Combined =
2. The estimated LD_{50} is 4.2 g/kg (2.9-6.1) g/kg 95% C.L.
3. Tox. Category: III. Classification: guideline

Procedure (~~Deviations from §81-1~~): 5M&5F rats were dosed by oral intubation (5M&5F/group), at 5 different dose levels - test mat. administered as 25% W/V solution in water - Animals observed for mortality and toxic symptoms @ 0-2, 4-6 hrs post treatment, and at daily intervals to 14 days. Gross necropsies on all animals

Results

Reported Mortality

DOSAGE (g /kg)	(NUMBER KILLED/NUMBER TESTED) Males	Females	Combined
2.0 g/kg	3/5	0/5	3/10
2.8 g/kg	2/5	0/5	2/10
4.0 g/kg	5/5	2/5	7/10
5.6 g/kg	1/5	3/5	4/10
8.0 g/kg	5/5	5/5	10/10

Symptomology & Gross Necropsy Findings:

Clinical: Terminal body weights showed losses for all animals - Prominent in life: soft stool, piloerection, "scruffy" unkempt appearance, fecal staining.

Necropsy: Prominent: soft stool, anal & oral discharge, red & yellow liquid, tan lungs, mottled liver, mottled lungs, staining & fecal staining of abdomen.

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

Reviewer: ~~the Weller~~ Woodrow
Product Manager: (21)
Report Date: 5-11-90
MRID No.: 87307
Report No. 4502-77
Testing Laboratory: Bio/Dynamics
Author(s): D.R. Heneghan
Species: Rabbit; NZ white
Sex: 3M ♂3F Wt.: 2.3-2.7 kg
Test Material: Compound 8641-175 (Bravo 500)
Quality Assurance (40 CFR §160.12):

008955

Summary:

1. LD_{50} (mg/kg): Males = ; Females = ; Combined = ;
2. The estimated LD_{50} is > 20.0 g/kg
3. Tox. Category: IV. Classification: Guidelines

Procedure (~~Deviations From §81-2~~): Backed 3M ♂3F rabbits clipped to effect approx 30% of surface (body) - ½ of clipped skin abraded longitudinally (each rabbit) 20.0 g/kg dose to each animal (5.4 ml), based on 1.26 g/ml density. Test mat. held in place by sleeve made of impervious material. Animals observed for mortality & topic signs daily to 14 days. 2 hr exposure; observations for

Results:

Reported Mortality

DOSAGE (20 /kg)	(NUMBER KILLED/NUMBER TESTED) Males	Females	Combined
20 g/kg	0/3	0/3	0/6

~~Symptomology & Gross Necropsy Findings:~~

edema/erythema & escher formation. Body wts. 0 & 14 days. All animals subjected to gross necropsy.

Clinical: Moderate to severe erythema (all) slight edema in 5 animals @ 24 hrs. Soft stool in 4 animals through day 6.

Necropsy: Kidneys pale tan; lungs mottled - animal

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

Product Manager: (21) Reviewer: ~~E. Miller~~

RID No.: 158494 Report Date: 5-11-90 008955

Testing Laboratory: WIL-11005/SDS Biotech Report No. SDS-2787

Author(s): N.H. Wilson

Species: Rabbit, NZ white (SMALE)

Sex: Blind compound # T-194-1 Wt.: not stated

Test Material: T-194-1 (Tech. chlorothalonil) Bravo 720 is 54% A.I.

Quality Assurance (40 CFR §160.12): adequate

Summary:

1. LD_{50} (mg/kg): Males = ; Females = ; Combined = ;
2. The estimated LD_{50} is > 2000 mg/kg
3. Tox. Category: III. Classification: Guidelines

Procedure (~~Deviations from §81-2:~~ 2000 mg/kg applied to 10% of surface skin on clipped dorsal of SMALE Fischer; Maintained in contact for 24 hours, gauze bandage. Animals were observed for toxic signs and/or mortality twice daily during dosing/post treatment, & weekly thereafter for 14 days - Application sites scored for irritation on days 1, 3, 7, 10 & 14. Body wts recorded days 0, 7, 7 & 14

Results:

Reported Mortality

DOSAGE (mg/kg)	(NUMBER KILLED/NUMBER TESTED) Males	Females	Combined
2000 mg/kg	0/5	0/5	0/10

~~Symptomology & Gross Necropsy Findings:~~

Necropsies performed on all animals.

Clinical: Local dermal irritation only; low incidence of diarrhea for most animals - All rabbits showed body wt. loss at some intervals during study.

Necropsy: Prominent gross findings included dark red & firm lungs (possibly pulmonary infection). No compound-related findings.

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

Product Manager: (21) Reviewer: W. Woodrow
MRID No.: 87310 Report Date: 5-11-90
Testing Laboratory: Bio/Dynamics Report No. 77-1946
Author(s): W.E. Reinhart
Species: Rat, Sprague Dawley
Sex: 5M/5F Weight: 217-300g.
Source: Charles River
Test Material: Compound 8641-125 (Bravo 500), liquid
Quality Assurance (40 CFR §160.12):

Summary:

1. LC_{50} (mg/kg): Males = ——; Females = ——; Combined = ——
2. The estimated LC_{50} is > 1.072 mg/L
3. Mean Concentration: ——
4. Tox. Category: —. Classification: Supplementary (see 2nd page)

Procedure ~~(Deviations From §81-2)~~: Test mat. placed in 3-neck flask, fitted with a "Leskin" aerosol generator. Dry air @ 9.0 L/min passed through generator. Aerosol → 265 L glass exposure chamber - 4 hour exposure. Nominal concentration determined: wt. material expended ÷ L air thru chamber. Animals observed for

Results:

Reported Mortality

Exposure Concentration (mg/L)	(NUMBER KILLED/NUMBER TESTED) Males	Females	Combined
1.072 mg/L	0/5	0/5	0/10

~~Symptomology & Gross Necropsy Findings~~:

mortality and toxicity during exposure & daily to 14 days. Body weights recorded @ 0, 1, 2, 7 & 14 days. Gross necropsies performed on all animals.

During exposure, chamber atmosphere sampled hourly via a GCA respirable dust monitor (Model RDM 201).

equipped w cyclone precollector, which is "100%" effecient removing 10μ particles or >, & "50%" effecient in removing 3.5μ particles, or >. Samples taken with and without precollector - to determine 10μ particles or <. (3.5 to 10μ).

Results Nominal Concentration of 7.16 mg/L.
Total mass concentration (mg/L) (without Cyclone Precollector) = 1.072 (av. of 4 measurements)

No animals died, all gained weight. No "definitive" toxic signs during study observation period. Necropsy findings suggested possibility of some pulmonary toxicity.

No particle size distribution studies; NO MMAD, GS Deviation.

Accuracy of total mass/mg/cu.m concentration needed mass verification.

Respirable particles (sizes) was only classification, with no verification of accuracy.

Supplementary Data: see above remarks.

DATA REVIEW FOR ACUTE EYE IRRITATION TESTING (§81-4)

oduct Manager: (21) Reviewer: ~~Miller~~ Woodrow
ID No.: 87177 Report Date: 5-11-90
sting Laboratory: Bio/Dynamics, Inc. Report No. 643-80-~~165~~
thor(s): N. H. Wilson
ecies: Monkeys ~~Rabbits~~, Cynomolgus
Sex: 9 male Weight:
Source: Primate Imports, Port Wash., L.I., N.Y. 008955
sage: 0.1ml
st Material: T-111-3 (Bravo 500), liquid
ality Assurance (40 CFR §160.12): adequate

mary:

ox. Category: II Classification: Guidelines

cedure (~~Deviation From §81-4~~): 0.1ml test material instilled into r eye of each of 9 monkeys, to the conjunctival sac - 20 sec. after treatment, eyes of 3 monkeys washed for 1 minute c 100 ml water - treated eyes examined and scored at 24, 48, 72 hours, and at 4, 7, 14 & 21 days for irritation.
ults:

Observations
(number "positive"/number tested)

	Hour	Days						
	1	1	2	3	4	7	14	21
nea pacity		6/9	6/9	6/9	4/9	2/9	2/9	0/9
s		0/9	0/9	0/9	0/9	0/9	0/9	0/9
junctivae edness		9/9	9/9	9/9	7/9	2/9	0/9	0/9
hemosis		1/9	0/9	0/9	0/9	0/9	0/9	0/9
ischarge		0/9	0/9	0/9	0/9	0/9	0/9	0/9

ments: Corneal opacity through Day 14, absent by Day 21. No iris involvement. Conjunctival irritation absent by Day 14.

DATA REVIEW FOR ACUTE EYE IRRITATION TESTING (§81-4)

oduct Manager: (21)
ID No.: 87178
sting Laboratory: Bio/Dynamics, Inc.
thor(s): P.R. Hershberger
ecies: Rabbit, NZ White
Sex: 3m+3F Weight:
Source: Harland Breeding Farms - N.J.
sage: 0.1ml
st Material: Compound 8641-125 (Bravo 500 - 40.4% A.I.)
ality Assurance (40 CFR §160.12): none

Reviewer: Woodrow
Report Date: 5-10-90
Report No. 4513-77

008955

mmary:

Tox. Category: III Classification: Guidelines

ocedure ~~(Deviation From §81-4)~~: 0.1ml test material into one eye of each of 3m+3F rabbits. Eyes unwashed. Eyes examined and scored for irritation on days 1, 2, 3 and 7, according to the Draize system.

sults:

	Observations (number "positive"/number tested)						
	Hour	Days					
	1	1	2	3	4	7	14	21
rnea Opacity		2/6	1/6	0/6		0/6		
is		0/6	0/6	0/6		0/6		
njunctivae Redness		5/6	5/6	2/6		0/6		
Chemosis		4/6	2/6	0/6		0/6		
Discharge		4/6	3/6	0/6		0/6		

mments: No iris involvement, Corneal involvement absent by day 3. Conjunctival redness absent by Day 7 (present through day 3)

DATA REVIEW FOR ACUTE EYE IRRITATION TESTING (§81-4)

oduct Manager: (2-1) Reviewer: ~~M. Hatter~~ Woodrow
ID No.: 87177 Report Date: 5-11-90
sting Laboratory: Bio/Dynamics Report No. 6504-80
thor(s): N. H. Wilson 008955
ecies: Rabbit, NZ white
Sex: 9 M/F Weight:
Source: Dutchland Lab. animals, Denver, PA.
sage: 0.1ml
st Material: T-111-3 (Bravo 500), liq
ality Assurance (40 CFR §160.12): adequate

mmary:

Tox. Category: III Classification: Guidelines

ocedure (~~Deviation from §81-4~~): 0.1ml instilled into 1 eye of each of 9 rabbits. 20 sec. after application (to conjunctival sac), treated eye of 3 rabbits washed for 1 minute w/ 100 ml water. All treated eyes examined and scored for irritation @ 24, 48, 72 hours & at days 4, 7, 14 days, and at 21 days.

sults:

	Observations (number "positive"/number tested)							
	Hour	Days						
	1	1	2	3	4	7	14	21
rnea		6/9	5/9	3/9	0/9	0/9	0/9	
pacity		0/9	0/9	0/9	0/9	0/9	0/9	
s								
junctivae		9/9	9/9	5/9	3/9	0/9	0/9	
edness		7/9	7/9	6/9	1/9	0/9	0/9	
hemosis		8/9	6/9	3/9	0/9	0/9	0/9	
ischarge								

ments: Max irritation, Corneal involvement cleared by day 4. Conjunctival irritation cleared by day 7.

DATA REVIEW FOR ACUTE EYE IRRITATION TESTING (§81-4)

Product Manager: (21)
MRID No.: 158493
Testing Laboratory: WIL Res. Labs., Inc.
Author(s): D. J. Nass
Species: Rabbit, N.Z. White
Sex: 6M+3F N.Z. + Weight:
Source: Mohican Valley Rabbitry, O.
Dosage: 0.1ml
Test Material: Bravo 720 (54.0% A.I.), liquid
Quality Assurance (40 CFR §160.12): adequate

Reviewer: ~~M. Waller~~ W. Woodrow
Report Date: 5-10-90
Report No. WIL-11006
SDS-2787

Summary:

Tox. Category: II Classification: Guidelines

Procedure ~~(Deviation From §81-4)~~: 0.1ml undiluted test material instilled into the conjunctival sac of 6 male + 3 female. 20-30 seconds after treating eyes of 3 males, these eyes were flushed ± 100ml tap water. Eyes examined and scored for irritation according to Draize @ 1, 24, 48, 72 hours, and days 4, 7, 10, 14, and 21 post dosing.

Results:

Observations (number "positive"/number tested)

	Hour	Days						
	1	1	2	3	4	7	~~10~~ 14	21
Cornea Opacity	0/6	2/6	3/6	1/6	0/6	0/6	0/6	0/6
Iris	0/6	0/6	0/6	0/6	0/6	0/6	0/6	0/6
Conjunctivae Redness	6/6	6/6	6/6	6/6	6/6	3/6	0/6	0/6
Chemosis	5/6	6/6	6/6	6/6	6/6	3/6	1/6	0/6
Discharge	2/6	3/6	4/6	3/6	1/6	1/6	1/6	0/6

~~Comments~~: The scores for the 3 washed (treated) rabbit eyes were considerably less than comparable scores for unwashed eyes; therefore washed scores were not utilized to decide Tox. Ca

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

Product Manager: (21)
MRID No.: 87308
Testing Laboratory: Bio/dynamics, Inc.
Author(s): P.H. Heenehan
Species: Rabbit, NZ white
Age: not stated
Sex: 3M/3F
Weight: 2.15-2.45 kg.
Dosage: 0.5ml undiluted
Test Material: Bravo 500 (compound 8641-125) - 40.4% Tech. Chlorothalonil
Quality Assurance (40 CFR §160.12): none

Reviewer: ~~M. Miller~~
Report Date: 5-10-90
Report No.: 4503-77

008955

Summary:

The Primary Irritation Index = 1.3

Toxicity Category: IV

Classification: Guidelines

Procedure ~~(Deviations From §81-5):~~ 0.5ml undiluted test material applied to 1 intact and to 1 abraded test site (on clipped backs of animals 6 rabbits, under 1" sq. gauze. Dose secured with tape/animals wrapped in plastic sheeting secured w tape 24 hours contact. Animals observed and scored for ~~Results:~~ irritation at 24 and 72 hours post application. (Erythema/edema/eschar).

			mean scores
24hrs	intact skin	Erythema	0.7
		Edema	0.5
	Abraded skin	Erythema	0.8
		Edema	0.7
72hrs	intact sk.	Erythema	0.8
		Edema	0.3
	abraded skin	Erythema	1.2
		Edema	0.2
		total	5.2

Special Comments:

5.2 / 4 = 1.3 = P.I. Index

mild or slight irritation @ 72hrs: Tox. Category IV

21

DATA REVIEW FOR SKIN SENSITIZATION TESTING (§81-6)

Product Manager: (21)
MRID No.: 405460-02
Testing Laboratory: WIL Res. Lab., Inc.
Author(s): S.K. Shultz, M.H. Wilson
Species: Guinea pig
Sex: 24M, 24F
Source: Buckshire Corp.
Test Material: Bravo 720 (blind No. T-194-1) 54.0% a.i.
Positive Control Material: dinitrochlorobenzene (DNCB)
Quality Assurance (40 CFR §160.12): adequate

Reviewer: Woodrow
Report Date: 5-3-90
Report No. SDS/2787

Weight: 300-450 g

Method: Modified Buehler closed patch - repeated insult

Summary:
1. This product [is] / is not a dermal sensitizer.
2. Classification: Guidelines

Procedure ~~(Deviation From §81-6)~~: A range finding study was conducted to determine the irritation potential of the test material (Bravo 720) & + emitted dinitrochlorobenzene (DNCB). Undiluted Bravo 720 & Concentrations in 80% ethanol and acetone were used in the main study.

~~Results~~: Procedure quoted from the testing report.

Group	Test/Control Materials	Number of Animals	Concentration Induction	Challenge	Rechallenge
I	Bravo® 720	12 (6M, 6F)	100%	100%	100%
II	DNCB (Positive Control)	12 (6M, 6F)	0.1%	0.05%	0.05%
III[b]	Bravo® 720 (Irritation Control-Challenge)	12 (6M, 6F)	--	100%	--
	DNCB (Irritation Control-Challenge)		--	0.05%	--
IV[c]	Bravo® 720 (Irritation Control-Rechallenge)	12 (6M, 6F)	--	--	100%
	DNCB (Irritation Control-Rechallenge)		--	--	0.05%

[a] Bravo® 720 was administered in undiluted form during the induction, challenge and rechallenge phases of the study. DNCB was administered in 80% ethanol for the induction phase and in acetone for the challenge and rechallenge phases of the study.

[b] This irritation control group was treated only at challenge. The same twelve animals served as irritation controls for the test and positive control materials.

Unacceptable.

Induction: 3 applications per week, 9 total; to clipped backs of animals. Dose volume was 0.4 ml. 2 cm² patches, dental dam + tape secured patches. 6 hour exposure. Irritation scored for @ 24 + 48 hours after the initial application; and 24 hours after subsequent applications. (4 days after last induction application animals...

Challenged at a previously unused (naive) site. Naive (control) animals challenged at separate sites with test and positive control materials — sites scored at 24 + 48 hours after application. Each animal's test and positive control groups re-challenged at naive sites. All animals observed 2x daily for health.

Results:

1) Positive control: DNCB did sensitize guinea pigs.

2) Bravo 720. In order to calculate numbers for each challenge + re-challenge individual results @ 24 hours, ± results were considered 0.5:

Challenge	24 hrs	Irritation	24 hrs
Bravo 720 mean =	0.66	control	0.38
Rechallenge mean =	0.54	Irritation control	0.17
Bravo 720			

Conclusion:

Bravo 720 is a weak sensitizing agent.