

FOR DU PONT USE ONLY

Du Pont HLO 379-90

Study Title

100-Person Human Patch Test of

[REDACTED] (Test Item)

[REDACTED] (Control Item)

Study Completed On

July 11, 1990

Contracting Laboratory

Bioresearch, Inc.
3408-50 B Street
Philadelphia, Pennsylvania 19134

for

E. I. du Pont de Nemours and Company
Haskell Laboratory for Toxicology and Industrial Medicine
Elkton Road, P. O. Box 50
Newark, Delaware 19714

[REDACTED]

Laboratory Project ID

Haskell Laboratory Report No. 379-90

Company Sanitized. Does not contain TSCA CBI

GENERAL INFORMATION

Material Tested:

Medical Research No.:

Haskell No.:

Haskell Test Code:

Biosearch Project No.:

Physical Form:

Synonyms:

Other Codes:

Material Tested:

Medical Research No.:

Haskell No.:

Haskell Test Code:

Biosearch Project No.:

Physical Form:

Synonyms:

Test Material

[REDACTED]

18,330

[REDACTED]

90-7004H

White fabric

[REDACTED]

Control Material

[REDACTED]

18,331

[REDACTED]

90-7004H

White fabric

[REDACTED]

Du Pont HLO 379-90

GENERAL INFORMATION CONT.

Other Codes:

[REDACTED]

Sponsor:

Fibers Department
E. I. du Pont de Nemours and Company
Wilmington, Delaware

Materials Submitted by:

[REDACTED]

Fibers Department
E. I. du Pont de Nemours and Company
Chambers Works
Deepwater, New Jersey

Study Initiated - Completed:

5/7/90 - 7/11/90

In-Life Phase
Initiated - Completed:

5/7/90 - 6/20/90

Distribution:

[REDACTED]

Du Pont HLO 379-90

CENTRAL RESEARCH AND DEVELOPMENT DEPARTMENT
HASKELL LABORATORY FOR TOXICOLOGY
AND INDUSTRIAL MEDICINE

July 11, 1990

[REDACTED]
Fibers Department
Kinston Plant
Kinston, North Carolina

100-Person Human Patch Test of

[REDACTED] (Test Item)

[REDACTED] (Control Item)

Attached is a report from Biosearch, Inc. (Biosearch, Inc., Project No. 90-7004H). Included in the report are patch test methods, results and conclusions.

No dermal irritation was observed at anytime in any of the 101 active participants when tested with [REDACTED] (Test Item) or [REDACTED] (Control Item).

The results of Biosearch, Inc. are acceptable and indicate that the Nylon® samples are neither skin irritants nor sensitizing agents under the conditions of testing.

Dolores E. Malek

Dolores E. Malek, Ph.D.
Research Toxicologist

DEM/lmr/HLO9.34

Company Sanitized. Does not contain TSCA CBI

Project Number: 90-7004H

E.I. Du Pont De Nemours & Company

Modified Draize Repeated Insult Patch Test Study in Human Subjects

SUBJECT LIST

Subject Number	Initials	Age	Occupation	Allergies
1	G.R.	28	Homemaker	
2	M.V.C.	26	Homemaker	
3	C.S.	45	Homemaker	
4	S.C.	43	Registered Nurse	
5	M.G.	58	Homemaker	
6	V.F.	44	Homemaker	
7	G.I.	33	Unknown	
8	R.G.	63	Handyman	
9	H.S.	57	Homemaker	
10	H.E.C.	36	Brick Pointer	
11	E.M.	33	Homemaker	
12	C.S.L.	57	Homemaker	
13	A.G.	32	Homemaker	House dust
14	J.A.	33	Mechanic	Penicillin
15	I.J.	50	Homemaker	
16	R.S.	42	Unemployed	
17	D.R.	26	Sub-Teacher Aide	
18	K.L.	21	Homemaker	
19	C.H.E.	53	Homemaker	
20	K.M.	29	Homemaker	
21	P.H.	60	Homemaker	
22	M.A.	60	Homemaker	
23	M.C.	43	Homemaker	
24	M.S.	33	Homemaker	
25	A.B.	64	Homemaker	
26	T.R.	38	Painter	
27	L.G.	27	Homemaker	Cats, Penicillin
28	K.T.	21	Housewife	
29	C.D.	44	Homemaker	Fiberglass
30	W.L.	54	Unemployed	
31	J.R.	64	Cleaning Man	Hayfever
32	M.W.	60	Homemaker	
33	D.H.	56	Homemaker	
34	E.H.	58	Grocery Clerk	
35	D.V.	50	Homemaker	
36	M.S.	45	Homemaker	
37	D.N.	25	Unemployed	
38	B.N.	32	Cashier	
39	J.N.	37	Unemployed	
40	K.B.	35	Nurse's Aide	
41	D.R.	29	Homemaker	Penicillin, Codeine
42	C.A.M.	40	Homemaker	Starch
43	J.W.	20	Homemaker	
44	M.M.	31	Factory Worker	
45	J.B.	36	Homemaker	Asthma

Project Number: 90-7004H

E.I. Du Pont De Nemours & Company

Modified Draize Repeated Insult Patch Test Study in Human Subjects

SUBJECT LIST

Subject Numbe.	Initials	Age	Occupation	Allergies
46	C.A.D.	52	Homemaker	
47	N.B.	59	Homemaker	
48	D.A.	61	Homemaker	
49	G.H.	56	Homemaker	
50	J.D.T.	58	Homemaker	
51	S.K.	20	Dry Wall Installer	
52	G.L.	34	Unemployed	
53	E.T.	58	Unemployed	
54	M.C.	59	Cafeteria Worker	
55	E.D.	36	Homemaker	
56	T.F.	54	Unemployed	
57	M.A.	61	Homemaker	
58	P.A.N.	37	Homemaker	
59	M.M.	62	Homemaker	
60	J.M.	64	Homemaker	
61	J.W.	44	Homemaker	
62	J.J.H.	57	Unemployed	
63	S.R.	58	Homemaker	Sulfa Drug
64	K.M.	30	Unknown	
65	D.F.	56	Retired	Penicillin
66	E.S.	51	Homemaker	
67	W.S.	56	Retired	
68	J.L.	20	Cashier	
69	D.G.	32	Homemaker	
70	M.L.S.	34	Homemaker	
71	R.C.G.	46	Housewife	
72	J.F.	42	Homemaker	
73	D.B.	42	Homemaker	
74	A.M.	64	Homemaker	
75	C.H.	60	Homemaker	
76	M.F.	38	Homemaker	
77	J.G.	16	Student	
78	M.B.	34	Homemaker	
79	W.W.	17	Student	Dust
80	P.D.	65	Retired	
81	A.M.	59	Homemaker	
82	P.M.	30	Security	Cats
83	M.M.	55	Ward Clerk	
84	C.C.	44	Homemaker	
85	D.M.	41	Homemaker	
86	K.W.	37	Homemaker	
87	V.A.O.	48	Registered Nurse	
88	D.W.	65	Teacher's Aide	Aspirin, Sulfa Drugs
89	M.B.	42	Data Entry	
90	F.P.M.	48	Unemployed	

Project Number: 90-7004H

E.I. Du Pont De Nemours & Company

Modified Draize Repeated Insult Patch Test Study in Human Subjects

SUBJECT LIST

Subject Number	Initials	Age	Occupation	Allergies
91	B.C.	40	Crossing Guard	
92	L.J.L.	41	Lab Technician	
93	D.B.	16	Student	
94	D.S.	35	Homemaker	
95	K.H.	17	Student	
96	L.H.	31	Homemaker	
97	A.B.	61	Homemaker	
98	D.E.	34	Homemaker	
99	R.B.	30	Homemaker	
100	C.B.	24	Homemaker	
101	L.A.M.	26	Homemaker	
102	Y.A.	34	Homemaker	
103	M.M.E.	30	Homemaker	
104	A.C.	42	Teacher Aide	
105	V.C.	61	Unknown	
106	M.B.	31	Homemaker	
107	M.W.	59	Packer	Penicillin

Project Number: 90-7004H

E.I. Du Pont De Nemours & Company

Modified Draize Repeated Insult Patch Test Study in Human Subjects

<u>Age Range (years)</u>	<u>No. of Subjects</u>	<u>% of Subjects</u>
16 to 17	4	3.7
18 to 29	14	13.1
30 to 39	29	27.1
40 to 49	20	18.7
50 to 55	8	7.5
Over 55	32	29.9
Total Subjects	107	100.0

BIOSEARCH INCORPORATED

P.O. Box 8598, Philadelphia, Pennsylvania 19101

Telephone: (215) 739-4499

Fax: (215) 423-9210

Project Number: 90-7004H

Testing Facility: Biosearch Incorporated
3408-50 "B" Street
Philadelphia, PA 19134

Sponsor: E.I. Du Pont De Nemours & Company
P.O. Box 50, Elkton Road
Newark, DE 19714

Test Article: H-18,330

Test Article Description: White material

Test Article Received: 05/04/90

Study Initiated: 05/07/90 Study Completed: 06/20/90

Date of Report: 06/21/90

Test: Modified Draize Repeated Insult Patch Test Study in Human
Subjects

Object of Test: To determine the irritating, fatiguing and sensitizing properties of the test article.

Method of Test: The method employed in carrying out this test was similar to that described in "Appraisal of the Safety of Chemicals in Foods, Drugs and Cosmetics" by J.H. Draize and published by the Association of Food and Drug Officials of the United States.

The test involved the application of the test article to the upper arms of a group of 107 volunteer subjects. One hundred and one subjects completed the study. These subjects were all determined to be in good general health and free of any visible skin disease or anomaly in the area to be patched. Each subject was required to read, understand and sign an informed consent statement.

The test article was tested as supplied.

Project Number: 90-7004H

E.I. Du Pont De Nemours & Company - H-18,330

Modified Draize Repeated Insult Patch Test Study in Human Subjects

Method of Test:

Induction Phase

Approximately a one-inch square portion of test article was applied to the skin site and covered with 2" Dermicel® hypoallergenic cloth tape (Johnson & Johnson, New Brunswick, NJ 08903). The patch remained in place for 24 hours.

At the end of this period, the patch was removed and the site was examined for any dermal response. Scoring of irritation was in accordance with the scale in the Appendix. The subjects were then rested for a 24 hour period after which the skin site was again examined. A patch was then applied to the same site as previously used. The second application was identical to the first and remained in place 24 hours. This procedure was repeated on Mondays, Wednesdays and Fridays until a series of ten applications had been made. Patch applications made on Friday were removed by the subject on Saturday. The subjects examined the site for any dermal response and reported their observations prior to the next application. The same site continued to be used throughout the study.

Challenge Phase

After the 10th application, a rest period of approximately 2 - 3 weeks elapsed after which a challenge application was applied in the same manner and to the same sites described above. A duplicate challenge application was also applied in the same manner to a virgin site (previously untreated). The challenge application was removed after 24 hours and the sites were examined for signs of irritation or sensitization. Follow up examinations were conducted at 48 hours after the challenge application.

The subjects involved in this study ranged in age from 16 to 65 years of age.

Results:

See accompanying table, summary and appendix.

Project Number: 90-7004H

E.I. Du Pont De Nemours & Company - H-18,330

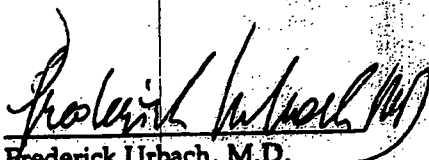
Modified Draize Repeated Insult Patch Test Study in Human Subjects

Conclusion:

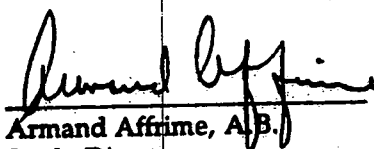
From the results obtained in this study as described above with the particular group of subjects tested, the test article is most likely not a primary skin irritant. The test article is most likely not a fatiguing agent. The test article is most likely not a sensitizing agent.

Signatures:

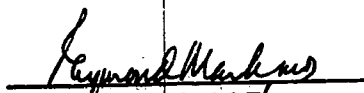
Submitted by Biosearch, Incorporated



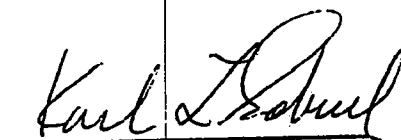
Frederick Urbach, M.D.
Consultant Dermatologist



Armand Affrime, A.B.
Study Director



Raymond Mark, M.D.
Medical Director



Karl L. Gabriel, V.M.D., Ph.D.
President

Project Number: 90-7004H

E.I. Du Pont De Nemours & Company - H-18,330, as supplied.

Modified Draize Repeated Insult Patch Test Study in Human Subjects

Table 1

Subject Number	Induction Phase										Challenge	
	1		2		3		4		5		6	
	24	48	24	48	24	48	24	48	24	48	24	48
1	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0	0

24 = Reading 24 hours after application
48 = Reading 48 hours after previous application but just before next application
- = Not Graded
* = Missed application
D = Discontinued; subject withdrew from study for personal reasons.

Company Sanitized. Does not contain TSCA CBI

Project Number: 90-7004H

E.I. Du Pont De Nemours & Company - H-18,330, as supplied.

Modified Draize Repeated Insult Patch Test Study in Human Subjects

Table 1 (continued)

Subject Number	Induction Phase										Challenge	
	1 24 48	2 24 48	3 24 48	4 24 48	5 24 48	6 24 48	7 24 48	8 24 48	9 24 48	10 24 48	Original Site 24 48	Virgin Site 24 48
26	0	0	0	0	0	0	0	0	0	0	D	D
27	0	0	0	0	0	0	0	0	0	0	0	0
28	0	0	0	0	0	0	0	0	0	0	0	0
29	0	0	0	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0	0	0	0
31	0	0	0	0	0	0	0	0	0	0	0	0
32	0	0	0	0	0	0	0	0	0	0	0	0
33	0	0	0	0	0	0	0	0	0	0	0	0
34	0	0	0	0	0	0	0	0	0	0	0	0
35	0	0	0	0	0	0	0	0	0	0	0	0
36	0	0	0	0	0	0	0	0	0	0	0	0
37	0	0	0	0	0	0	0	0	0	0	0	0
38	0	0	0	0	0	0	0	0	0	0	0	0
39	0	0	0	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0	0	0	0
41	0	0	0	0	0	0	0	0	0	0	0	0
42	0	0	0	0	0	0	0	0	0	0	0	0
43	0	0	0	0	0	0	0	0	0	0	0	0
44	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	0	0	0	0	0
46	0	0	0	0	0	0	0	0	0	0	0	0
47	0	0	0	0	0	0	0	0	0	0	0	0
48	0	0	0	0	0	0	0	0	0	0	0	0
49	0	0	0	0	0	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0	0	0	0	0	0

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- = Not graded

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D = Discontinued; subject withdrew from study for personal reasons.

Project Number: 90-7004H

E.I. Du Pont De Nemours & Company - H-18,330, as supplied.

Modified Draize Repeated Insult Patch Test Study in Human Subjects

Table 1 (continued)

Subject Number	Induction Phase										Challenge	
	1		2		3		4		5		6	
	24	48	24	48	24	48	24	48	24	48	24	48
51	0	0	0	0	0	0	0	0	0	0	0	0
52	0	0	0	0	0	0	0	0	0	0	0	0
53	0	0	0	0	0	0	0	0	0	0	0	0
54	0	0	0	0	0	0	0	0	0	0	0	0
55	0	0	0	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0	0
57	0	0	0	0	0	0	0	0	0	0	0	0
58	0	0	0	0	0	0	0	0	0	0	0	0
59	0	0	0	0	0	0	0	0	0	0	0	0
60	0	0	0	0	0	0	0	0	0	0	0	0
61	0	0	0	0	0	0	0	0	0	0	0	0
62	0	0	0	0	0	0	0	0	0	0	0	0
63	0	0	0	0	0	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0	0	0	0	0	0
68	0	0	0	0	0	0	0	0	0	0	0	0
69	0	0	0	0	0	0	0	0	0	0	0	0
70	0	0	0	0	0	0	0	0	0	0	0	0
71	0	0	0	0	0	0	0	0	0	0	0	0
72	0	0	0	0	0	0	0	0	0	0	0	0
73	0	0	0	0	0	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0	0

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Project Number: 90-7004H

E.I. Du Pont De Nemours & Company - H-18,330, as supplied.

Modified Draize Repeated Insult Patch Test Study in Human Subjects

Table 1 (continued)

Subject Number	Induction Phase										Challenge	
	1 24 48	2 24 48	3 24 48	4 24 48	5 24 48	6 24 48	7 24 48	8 24 48	9 24 48	10 24 48	Original Site 24 48	Virgin Site 24 48
76	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
77	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
78	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
79	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
80	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
81	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
82	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
83	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
84	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
85	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
86	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
87	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
88	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
89	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
90	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
91	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
92	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
93	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
94	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
95	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
96	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
97	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
98	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
99	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
100	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0

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Project Number: 90-7004H

E.I. Du Pont De Nemours & Company - H-18,330, as supplied.

Modified Draize Repeated Insult Patch Test Study in Human Subjects

Table 1 (continued)

Subject Number	<u>Induction Phase</u>										<u>Challenge</u>	
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	<u>Original</u> <u>Site</u>	<u>Virgin</u> <u>Site</u>
	<u>24 48</u>	<u>24 48</u>	<u>24 48</u>	<u>24 48</u>	<u>24 48</u>	<u>24 48</u>	<u>24 48</u>	<u>24 48</u>	<u>24 48</u>	<u>24 48</u>	<u>24 48</u>	<u>24 48</u>
101	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
102	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
103	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
104	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
105	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
106	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
107	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0

24 = Reading 24 hours after application
48 = Reading 48 hours after previous application but just before next application
- = Not graded
D = Discontinued; subject withdrew from study for personal reasons.

Project Number: 90-7004H

E.I. Du Pont De Nemours & Company - H-18,330, as supplied.

Modified Draize Repeated Insult Patch Test Study in Human Subjects

Summary of Table 1

	<u>Induction Phase</u>										<u>Challenge</u>	
											<u>Original Site</u>	<u>Virgin Site</u>
	1	2	3	4	5	6	7	8	9	10	24 48	24 48
	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48
<u>Total</u>	107	107	107	107	107	107	107	107	107	107	107	107
<u>Subjects:</u>	107	107	107	107	107	107	107	107	107	107	107	107
<u>Readings</u>												
0	105	106	102	106	106	106	106	106	106	106	101	101
-	2	0	4	0	0	2	0	2	0	2	0	0
*	0	0	0	0	0	0	0	0	1	0	0	0
D	0	1	1	1	1	1	1	1	1	2	2	6

24 = Reading 24 hours after application
48 = Reading 48 hours after previous application but just before next application
- = Not graded
* = Missed application
D = Discontinued; subject withdrew from study for personal reasons.

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Project Number: 90-7004H

E.I. Du Pont De Nemours & Company - H-18,330

Modified Draize Repeated Insult Patch Test Study in Human Subjects

GRADING SCALE

Human Patch Test Studies

<u>Reading</u>	<u>Interpretation</u>
0	negative
±	suspicious
1+	slight erythema
2+	well defined erythema
3+	erythema with induration
4+	erythema with ulceration

DEFINITIONS*

Sensitization is a phenomenon which manifests itself by local effects on either skin or mucous membranes. It differs from primary irritation in that it may also involve tissues remote from the site of application. These reactions represent an allergy to a chemical which is not obtained on first contact, but requires a number of prior exposures for development.

Repeated patch applications of substances to both man and animals reveal that certain substances which, at a given concentration, do not produce primary irritation may elicit severe skin reactions after a number of exposures. Nevertheless, these reactions may not be considered incidents of sensitization since after 10-14 days of rest the skin recovers its original resistance to injury by the substance. For the lack of a better term such reactions have been called "skin fatigue". This latter term is a misnomer in that it does not imply a condition in which the skin has lost significant normal physiological function. This phenomenon consists of a subtle change in which the skin no longer exhibits its original refractoriness or resistance to the continued or repeated action of an agent.

* Draize, J.H. 1959. Appraisal of the Safety of Chemicals in Foods, Drugs and Cosmetics. In DERMAL TOXICITY, p.46-53. Topeka, Kansas: Association of Food and Drug Officials of the United States.

BIOSEARCH INCORPORATED

P.O. Box 8598 Philadelphia, Pennsylvania 19101

Telephone: (215) 739-4499

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Du Pont HLO 379-99

Project Number: 90-7004H

Testing Facility: Biosearch Incorporated
3408-50 "B" Street
Philadelphia, PA 19134

Sponsor: E.I. Du Pont De Nemours & Company
P.O. Box 50, Elkton Road
Newark, DE 19714

Test Article: H-18,331

Test Article Description: White material

Test Article Received: 05/04/90

Study Initiated: 05/07/90 Study Completed: 06/20/90

Date of Report: 06/21/90

Test: Modified Draize Repeated Insult Patch Test Study in Human
Subjects

Object of Test: To determine the irritating, fatiguing and sensitizing properties of the test article.

Method of Test: The method employed in carrying out this test was similar to that described in "Appraisal of the Safety of Chemicals in Foods, Drugs and Cosmetics" by J.H. Draize and published by the Association of Food and Drug Officials of the United States.

The test involved the application of the test article to the upper arms of a group of 107 volunteer subjects. One hundred and one subjects completed the study. These subjects were all determined to be in good general health and free of any visible skin disease or anomaly in the area to be patched. Each subject was required to read, understand and sign an informed consent statement.

The test article was tested as supplied.

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E.I. Du Pont De Nemours & Company - H-18,331

Modified Draize Repeated Insult Patch Test Study in Human Subjects

Method of Test:

Induction Phase

Approximately a one inch square portion of test article was applied to the skin site and covered with 2" Dermicel® hypoallergenic cloth tape (Johnson & Johnson, New Brunswick, NJ 08903). The patch remained in place for 24 hours.

At the end of this period, the patch was removed and the site was examined for any dermal response. Scoring of irritation was in accordance with the scale in the Appendix. The subjects were then rested for a 24 hour period after which the skin site was again examined. A patch was then applied to the same site as previously used. The second application was identical to the first and remained in place 24 hours. This procedure was repeated on Mondays, Wednesdays and Fridays until a series of ten applications had been made. Patch applications made on Friday were removed by the subject on Saturday. The subjects examined the site for any dermal response and reported their observations prior to the next application. The same site continued to be used throughout the study.

Challenge Phase

After the 10th application, a rest period of approximately 2 - 3 weeks elapsed after which a challenge application was applied in the same manner and to the same sites described above. A duplicate challenge application was also applied in the same manner to a virgin site (previously untreated). The challenge application was removed after 24 hours and the sites were examined for signs of irritation or sensitization. Follow up examinations were conducted at 48 hours after the challenge application.

The subjects involved in this study ranged in age from 16 to 65 years of age.

Results:

See accompanying table, summary and appendix.

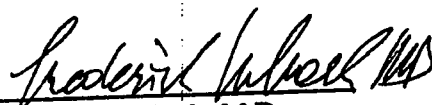
Project Number: 90-7004H

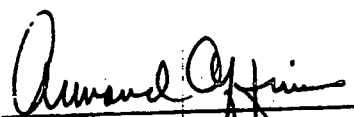
E.I. Du Pont De Nemours & Company - H-18,331

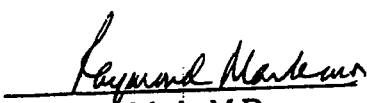
Modified Draize Repeated Insult Patch Test Study in Human Subjects

Conclusion: From the results obtained in this study as described above with the particular group of subjects tested, the test article is most likely not a primary skin irritant. The test article is most likely not a fatiguing agent. The test article is most likely not a sensitizing agent.

Signatures: Submitted by Biosearch, Incorporated:


Frederick Urbach, M.D.
Consultant Dermatologist


Armand Affrime, A.D.
Study Director


Raymond Mark, M.D.
Medical Director


Karl L. Gabriel, V.M.D., Ph.D.
President

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Project Number: 90-7004H

E.I. Du Pont De Nemours & Company - H-18,331, as supplied.

Modified Draize Repeated Insult Patch Test Study in Human Subjects

Table 1

Subject Number	Induction Phase										Challenge	
	1 24 48	2 24 48	3 24 48	4 24 48	5 24 48	6 24 48	7 24 48	8 24 48	9 24 48	10 24 48	Original Site 24 48	Virgin Site 24 48
1	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
2	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
3	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
4	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
5	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
6	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
7	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
8	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
9	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
10	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
11	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
12	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
13	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
14	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
15	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
16	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
17	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
18	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
19	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
20	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
21	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
22	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
23	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
24	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
25	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0

24 = Reading 24 hours after application

48 = Reading 48 hours after previous application but just before next application

- = Not graded

* = Missed application

D = Discontinued; subject withdrew from study for personal reasons.

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Project Number: 90-7004H

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Modified Draize Repeated Insult Patch Test Study in Human Subjects

Table 1 (continued)

Subject Number	Induction Phase										Challenge	
	1 24 48	2 24 48	3 24 48	4 24 48	5 24 48	6 24 48	7 24 48	8 24 48	9 24 48	10 24 48	Original Site 24 48	Virgin Site 24 48
26	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	D D	D D
27	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
28	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
29	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
30	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
31	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
32	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
33	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
34	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
35	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
36	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
37	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
38	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
39	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
40	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
41	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
42	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
43	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
44	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
45	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
46	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
47	0 0	0 0	0 0	0 0	0 0	0 0	0 *	0 *	0 0	0 0	0 0	0 0
48	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
49	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
50	0 0	0 0	0 0	0 0	0 0	0 0	-	0 0	0 0	0 0	0 0	0 0

24 = Reading 24 hours after application

48 = Reading 48 hours after previous application but just before next application

- = Not graded

* = Missed application

D = Discontinued; subject withdrew from study for personal reasons.

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Project Number: 90-7004H

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Modified Draize Repeated Insult Patch Test Study in Human Subjects

Table 1 (continued)

Subject Number	Induction Phase										Challenge	
	1	2	3	4	5	6	7	8	9	10	Original Site	Virgin Site
	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48
51	0 0	0 0	0 0	0 0	0 0	0 0	-	0 0	0 0	0 0	D D	D D
52	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
53	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
54	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
55	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
56	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
57	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
58	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
59	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
60	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
61	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
62	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
63	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
64	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
65	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
66	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
67	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
68	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
69	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
70	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
71	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
72	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
73	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
74	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
75	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0

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 - = Not graded
 D = Discontinued; subject withdrew from study for personal reasons.

Company Sanitized. Does not contain TSCA CH

Project Number: 90-7004H

E.I. Du Pont De Nemours & Company - H-18,331, as supplied.

Modified Draize Repeated Insult Patch Test Study in Human Subjects

Table 1 (continued)

Subject Number	Induction Phase										Challenge	
	1	2	3	4	5	6	7	8	9	10	Original Site	Virgin Site
	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48
76	0	0	0	0	0	0	0	0	0	0	0	0
77	0	0	0	0	0	0	0	0	0	0	0	0
78	0	0	0	0	0	0	0	0	0	0	0	0
79	0	0	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0	0	0
84	0	0	0	0	0	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0	0	0	0	0	0
87	0	0	0	0	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0	0	0	0	0
92	0	0	0	0	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0	0	0	0	0
98	0	0	0	0	0	0	0	0	0	0	0	0
99	0	0	0	0	0	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0	0	0	0	0	0

24 = Reading 24 hours after application

48 = Reading 48 hours after previous application but just before next application

- = Not graded

D = Discontinued; subject withdrew from study for personal reasons.

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Project Number: 90-7004H

E.I. Du Pont De Nemours & Company - H-18,331, as supplied.

Modified Draize Repeated Insult Patch Test Study in Human Subjects

Table 1 (continued)

Subject Number	Induction Phase										Challenge	
	1 24 48	2 24 48	3 24 48	4 24 48	5 24 48	6 24 48	7 24 48	8 24 48	9 24 48	10 24 48	Original Site 24 48	Virgin Site 24 48
101	0 0	0 0	0 0	- 0	0 0	0 0	0 0	0 0	0 0	0 -	0 0	0 0
102	0 0	0 0	0 0	0 0	- 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
103	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
104	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
105	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
106	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
107	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0

24 = Reading 24 hours after application
 48 = Reading 48 hours after previous application but just before next application
 - = Not graded
 D = Discontinued; subject withdrew from study for personal reasons.

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Project Number: 90-7004H

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Modified Draize Repeated Insult Patch Test Study in Human Subjects

Summary of Table 1

	Induction Phase										Challenge	
	1	2	3	4	5	6	7	8	9	10	Original Site	Virgin Site
	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48	24 48
Total	107	107	107	107	107	107	107	107	107	107	107	107
Subjects:	107	107	107	107	107	107	107	107	107	107	107	107
Readings	105	106	106	106	103	106	106	106	104	105	101	101
0	2	0	4	0	0	0	0	0	2	0	0	0
-	0	0	0	0	0	0	0	0	0	0	0	0
*	0	0	0	0	0	0	0	0	0	0	0	0
D	0	1	1	1	1	1	1	1	1	1	6	6
	101	101	101	101	101	101	101	101	101	101	101	101

24 = Reading 24 hours after application
 48 = Reading 48 hours after previous application but just before next application
 - = Not graded
 * = Missed application
 D = Discontinued; subject withdrew from study for personal reasons.

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Project Number: 90-7004H

Du Pont HLO 379-90
Appendix

E.I. Du Pont De Nemours & Company - H-18,331

Modified Draize Repeated Insult Patch Test Study in Human Subjects

GRADING SCALE

Human Patch Test Studies

Reading	Interpretation
0	negative
±	suspicious
1+	slight erythema
2+	well defined erythema
3+	erythema with induration
4+	erythema with ulceration

DEFINITIONS*

Sensitization is a phenomenon which manifests itself by local effects on either skin or mucous membranes. It differs from primary irritation in that it may also involve tissues remote from the site of application. These reactions represent an allergy to a chemical which is not obtained on first contact, but requires a number of prior exposures for development.

Repeated patch applications of substances to both man and animals reveal that certain substances which, at a given concentration, do not produce primary irritation may elicit severe skin reactions after a number of exposures. Nevertheless, these reactions may not be considered incidents of sensitization since after 10-14 days of rest the skin recovers its original resistance to injury by the substance. For the lack of a better term such reactions have been called "skin fatigue". This latter term is a misnomer in that it does not imply a condition in which the skin has lost significant normal physiological function. This phenomenon consists of a subtle change in which the skin no longer exhibits its original refractoriness or resistance to the continued or repeated action of an agent.

* Draize, J.H. 1959. Appraisal of the Safety of Chemicals in Foods, Drugs and Cosmetics. In DERMAL TOXICITY, p.46-53. Topeka, Kansas: Association of Food and Drug Officials of the United States.

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