

Scott L. Winkelman
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October 22, 2003

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2076779

Ms. Kathleen C. DeMeter, Director
Mr. Bruce York
National Highway Traffic Safety Administration
Office of Defects Investigation
400 Seventh Street, S.W.
Washington, D.C. 20590

Re: EA02-025: IR Response of E. I. du Pont de Nemours and Company

Dear Ms. DeMeter and Mr. York:

E. I. du Pont de Nemours and Company ("DuPont") respectfully submits this supplemental response to your letter inquiry to DuPont of June 3, 2003 regarding EA02-025. Since our initial submission on September 3, 2003, DuPont located these additional documents that we believe are responsive to Specification 1 of your inquiry.

Specifically, the enclosed records consist of underlying results from oxalic acid testing that DuPont conducted in 1999 in response to a request from Texas Instruments, as well as correspondence between DuPont and Texas Instruments regarding these results. The supplemental documents are labeled as DD/NHTSA No. 1 00121-00228. See also DuPont documents entitled "Oxalic Acid Test Avgs.," DD/NHTSA No. 1 00118-00120.

As always, DuPont endeavors to cooperate fully with your investigation. Please do not hesitate to contact me at 202-624-2972 or Katherine Havelly at 202-624-2882 if you have any questions about this supplemental submission.

Sincerely,



Scott L. Winkelman
Counsel to DuPont

cc: Mr. Jeffrey L. Quandt (w/o enclosures)

Enclosures (referenced documents)

OFFICE OF DEFECTS INVESTIGATION
OCT 22 12 28 PM '03
RECEIVED
NHTSA-210

Control

Sample Identification: CONTROL

Test Date: 10 May 1999

Out of 3 specimens, 0 excluded.

Sample comments: 3808K CONTROL

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LIMS 1.0-3.0)	STRESS @ 3% ELONG	STRESS @ 5% ELONG	STRESS @ 50% ELON	STRESS @ THRESHOLD	LOAD AT
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(F3) (Kpsi)	(F5) (Kpsi)	G (F50) (Kpsi)	YIELD (Kpsi)	MAX. LOAD (lbs)
1	34.74	77.84	451.8	9.664	13.14	29.14	22.31	52.11
2	38.83	97.82	439.2	9.597	13.08	29.05	22.21	58.24
3	35.31	79.86	462.4	9.799	13.23	29.38	22.41	52.97
Mean:	36.29	84.91	451.2	9.687	13.15	29.19	22.31	54.44
Standard Deviation:	2.21	11.29	11.6	.103	.08	.17	.10	3.32
Minimum:	34.74	77.84	439.2	9.597	13.08	29.05	22.21	52.11
Maximum:	38.83	97.82	462.4	9.799	13.23	29.38	22.41	58.24
Cof of Var:	6.10	13.19	2.58	1.06	.58	.57	.45	6.10

Sample Identification: CONTRM

Test Date: 10 May 1999

Out of 3 specimens, 0 excluded.

Sample comments: 300FN929 CONTROL

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbe)
1	24.49	87.89	343.0	7.610	9.677	19.43	13.97	36.79
2	23.28	79.37	348.5	7.686	9.727	19.43	13.80	34.92
3	23.78	83.39	351.7	7.605	9.662	19.36	14.13	35.67
Mean:	23.85	83.55	347.7	7.634	9.689	19.41	13.97	35.77
Standard Deviation:	.61	4.27	4.4	.045	.034	.04	.17	.91
Minimum:	23.28	79.37	343.0	7.605	9.662	19.36	13.80	34.92
Maximum:	24.49	87.89	351.7	7.686	9.727	19.43	14.13	36.79
Cof of Var:	2.64	5.10	1.27	.59	.36	.20	1.20	2.54

Sample Identification: CONTROL

Test Date: 10 May 1999

Out of 3 specimens, 0 excluded.

Sample comment: 500FN131 CONTROL

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1,0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	24.96	110.0	314.0	6.969	8.955	18.40	13.90	62.39
2	25.08	111.0	321.7	7.007	8.994	18.44	12.01	62.69
3	25.56	116.8	317.4	6.991	8.966	18.44	13.46	63.90
Mean:	25.20	112.9	317.8	6.989	8.972	18.43	13.15	63.00
Standard Deviation:	.32	3.4	3.9	.019	.020	.02	1.02	.00
Minimum:	24.96	110.0	314.0	6.969	8.955	18.40	12.01	62.39
Maximum:	25.56	116.8	321.7	7.007	8.994	18.44	13.90	63.90
Cof of Var:	1.27	3.01	1.21	.28	.20	.13	7.76	1.27



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COMPANY/BUSINESS GROUP

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BUSINESS SECTOR

LOCATION

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4 PAGES TO FOLLOW THIS SHEET

SPECIAL INSTRUCTIONS/INFORMATION TO RECIPIENT:

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CHEMICAL EXPOSURE DATA ON KAPTON

CHEMICAL EXPOSURE DATA ON 100V AND 200 HV						
CHEMICAL	TIME	TEMP.	% PROD. RETAINED			
			TENSILE	ELONG.	REDUCTION	
ACETONE	1 YR.	RT.	87	72	100	
ACETONE	24 DAYS	80 C	100	100	100	
ACETONE	34 DAYS	110 C	85	67	100	
ALCOHOL	3 DAYS	RT.		DISINTEGRATED		
ALCOHOL (4)	1 YR.	200 C	100	83	100	
ALCOHOL	1 YR.	RT.	100	82	100	
BENZENE	24 DAYS	80 C	100	100	100	
CELLULOSE	24 DAYS	130 C	100	83	100	
CHLOROFORM	1 YR.	RT.	82	82	100	
CHLOROFORM	24 DAYS	130 C	100	100	88	
CHLOROFORM	1 YR.	RT.	82	74	84	
CHLOROFORM	24 DAYS	80 C	100	100	100	
DIMETHYL ACETONE	8 DAYS	100 C	81	56	100	
DIOL	1 YR.	RT.	81	68	88	
DIOL	1 yr 6 mo	100 C	0	0	0	
DOX SULFONIC-VALENIC 1407	48 HRS	100 C		VARIOUS DEGRADATION		
DOX SULFONIC-VALENIC 5281	96 HRS	200 C	100	86	114	
EDC+ TRANSFORMER	1 YR.	RT.	89	33	130	
EDC+ TRANSFORMER	7 DAYS	100 C	82	18	134	
ETHYLENE GLYCOL	24 DAYS	80 C	95	84	98	
GLACIAL ACETIC	24 DAYS	110 C	83	62	100	
GLACIAL ACETIC	1 YR.	RT.	87	88	100	
GLACIAL ACETIC	24 DAYS	60 C	100	100	114	
HP-4 JET FUEL	181 DAYS	RT.	86	82	84	
HP-4 JET FUEL (2)	34 DAYS	100 C	94	76	113	
HYDROPEROXIDE	1 YR.	RT.	100	73	140	
HYDROPEROXIDE	24 DAYS	60 C	100	100	108	
P-CREOSOL	24 DAYS	100 C	100	77	102	
SOB. HYDROX. 100	1 YEAR	RT.		DISINTEGRATED		
STYROL	181 DAYS	RT.	83	56	85	
STYROL	16 DAYS	200 C	74	50	78	
STYROL-ETHYROL	2 DAYS	225 C	81	10	62	
SULFURIC ACID 10%	181 DAYS	RT.	78	71	63	
TOLUENE	1 YR.	RT.	84	66	87	
TOLUENE	24 DAYS	110 C	82	32	99	
TRANSIL OIL	4 HRS	100 C	100	100	100	
WATER	24 DAYS	130 C	100	83	100	
WATER VP-1	100 HRS	100 C		81		
WATER VP-10	100 HRS	100 C		49		

40 IN AIR AND IN THE PRESENCE OF WATER
IF WATER AND AIR ARE REMOVED, LIFE IS EXTENDED CONSIDERABLY
(IN 3 COLUMNS 1 AND 2)

(1) HYDROLYTIC FUEL (FRESHNESS)
(2) DEGRADATION SPEC. JET FUEL
(3) HYDROLYTIC FUEL + 0.1% COPPER FINGER
(4) CHLORINATED KAPTON (TRANSFORMER OIL)
(5) HYDROLYTIC TRANSFORMER OIL

OXALIC ACID TEST																
300HN																
		MODULUS	TENSL	ELONG.												
CONTROL		451.2	38.29	84.91												
ROOM TEMPERATURE																
		0.5% SOLUTION				1.0% SOLUTION				3.0% SOLUTION				1.0% SOLUTION		
		MODULUS	TENSL	ELONG.		MODULUS	TENSL	ELONG.		MODULUS	TENSL	ELONG.		MODULUS	TENSL	ELONG.
150 HRS.		431.9	35.58	105.4		458.7	34.34	87.87		430.2	28.95	83.11		438.1	24.08	38.15

OXALIC ACID TEST													
300FNS29													
		MODULUS	TENSIL	ELONG.									
CONTROL		347.7	28.85	83.55									
		ROCK TEMPERATURE						MIDTEMPERATURE					
		0.1% SOLUTION			6.1% SOLUTION			0.1% SOLUTION			6.1% SOLUTION		
		MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.
100 FNS		363.7	31.21	84.55	362.3	31.06	86.97	362	24.15	57.25	368	31.42	41.45

OXALIC ACID TEST														
50DFN131														
		MODULUS	TENSILE	ELONG.										
CONTROL		317.8	25.2	112.0										
		ROOM TEMPERATURE						NO DISINTEGRATION						
		1% SOLUTION			1% SOLUTION			5% SOLUTION			1% SOLUTION			
		MODULUS	TENSILE	ELONG.	MODULUS	TENSILE	ELONG.	MODULUS	TENSILE	ELONG.	MODULUS	TENSILE	ELONG.	
100 HR.		300.9	25.18	115	304.1	26.67	119.8	309.1	18.08	63.78	314.4	17.1	40.71	

E. I. DUPONT
 DUPONT ROAD
 CIRCLEVILLE, OH 43113

Sample Identification: 100HRS

Test Date: 10 May 1999

Out of 3 specimens, 0 excluded.

Sample comments: 300HM TH 0.5 % ORCALIC ACID SOLUTION @ ROOM TEMPERATURE

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	34.84	99.85	432.0	9.222	12.38	26.33	20.04	52.27
2	36.75	114.00	431.7	9.129	12.26	25.98	19.80	55.13
3	35.08	102.40	432.0	9.146	12.30	26.18	16.82	52.62
Mean:	35.56	106.40	431.9	9.166	12.32	26.16	18.89	53.34
Standard Deviation:	1.04	7.58	.2	.050	.06	.18	1.79	1.56
Minimum:	34.84	99.85 *	431.7	9.129	12.26	25.98	16.82	52.27
Maximum:	36.75	114.00	432.0	9.222	12.38	26.33	20.04	55.13
Cof of Var:	2.93	7.19	.05	.54	.51	.67	9.49	2.93

Sample Identification: 100MRS

Test Date: 10 May 1999

Out of 3 specimens, 0 excluded.

Sample comments: 30MM IN 5.0% OXALIC ACID SOLUTION @ ROOM TEMPERATURE

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON G (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	34.37	98.21	437.6	9.187	12.32	26.10	18.63	51.56
2	35.08	102.64	439.2	9.223	12.34	26.02	19.60	52.62
3	33.57	91.88	439.2	9.290	12.42	26.31	19.87	50.35
Mean:	34.34	97.57	438.7	9.233	12.36	26.14	19.36	51.51
Standard Deviation:	.75	5.40	.9	.052	.05	.15	.65	1.13
Minimum:	33.57	91.88	437.6	9.187	12.32	26.02	18.63	50.35
Maximum:	35.08	102.64	439.2	9.290	12.42	26.31	19.87	52.62
Cof of Var:	2.20	5.53	.21	.56	.42	.57	3.37	2.26

Sample Identification: 10MRS

Test Date: 10 May 1999

Out of 3 specimens, 0 excluded.

Sample comment: 300HM IN 0.5% OXALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LINS 1.0-3.0)	STRESS @ 2% ELONG (F2)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELON (F50)	STRESS @ THRESHOLD YIELD	LOAD AT MAX. LOAD
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	25.93	52.31	439.2	10.31	13.32	25.59	19.70	38.90
2	26.53	57.79	439.2	10.41	13.35	25.46	19.50	39.80
3	28.38	70.21	439.2	10.48	13.38	25.53	19.16	42.56
Mean:	26.95	60.11	439.2	10.40	13.35	25.52	19.45	40.42
Standard Deviation:	1.27	9.17	.0	.08	.09	.06	.27	1.91
Minimum:	25.93	52.31	439.2	10.31	13.32	25.46	19.16	38.90
Maximum:	28.38	70.21	439.2	10.48	13.38	25.59	19.70	42.56
Cof of Var:	4.73	15.26	.00	.79	.24	.25	1.39	4.73

Sample Identification: 100HRS

Test Date: 10 May 1999

Out of 3 specimens, 0 excluded.

Sample comments: 300HM IN 5.0% OXALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	23.55	33.35	427.5	10.52	13.49	-----	19.33	35.33
2	24.73	44.30	432.0	10.46	13.45	-----	19.03	37.09
3	23.99	36.80	439.8	10.70	13.64	-----	16.72	35.98
Mean:	24.09	38.15	433.1	10.50	13.53	-----	18.36	36.13
Standard Deviation:	.59	5.60	6.2	.17	.10	-----	1.43	.89
Minimum:	23.55	33.35	427.5	10.46	13.45	-----	16.72	35.33
Maximum:	24.73	44.30	439.8	10.70	13.64	-----	19.33	37.09
Cof of Var:	2.46	14.60	1.43	1.61	.76	-----	7.79	2.46

Sample Identification: 100HRS

Test Date: 10 May 1999

Out of 3 specimens, 0 excluded.

Sample comments: 300FH929 IN 0.5% OXALIC ACID SOLUTION @ ROOM TEMPERATURE

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LINE 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELON @ (F50)	STRESS @ THRESHOLD YIELD	LOAD AT MAX. LOAD
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lba)
1	30.96	92.02	269.8	7.679	10.000	23.47	16.02	46.44
2	30.49	92.28	369.4	7.702	9.969	23.17	15.88	45.73
3	32.20	98.76	351.9	7.597	9.903	23.34	16.32	48.30
Mean:	31.21	94.35	363.7	7.659	9.965	23.33	16.07	46.82
Standard Deviation:	.88	3.82	10.2	.055	.064	.15	.22	1.32
Minimum:	30.49	92.02	351.9	7.597	9.903	23.17	15.88	45.73
Maximum:	32.20	98.76	369.8	7.702	10.000	23.47	16.32	48.30
Cof of Vari	2.83	4.05	2.81	.72	.55	.65	1.39	2.83

Sample Identification: 106HRS

Test Date: 10 May 1994

Out of 3 specimens, 0 excluded.

Sample comments: 300FN929 IN 5.0% HYCALIC ACID SOLUTION @ ROOM TEMPERATURE

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LIMS 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELONG (F50)	STRESS THRESHOLD YIELD	LOAD AT MAX. LOAD
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	31.02	80.37	360.0	7.729	10.10	23.92	16.02	46.54
2	31.09	80.65	361.2	7.799	10.20	24.36	16.45	47.39
3	30.82	83.80	365.0	7.830	10.24	24.26	16.96	45.78
Mean:	31.05	86.97	362.3	7.776	10.10	24.18	16.47	46.57
Standard Deviation:	.54	2.68	3.0	.066	.07	.22	.47	.80
Minimum:	30.52	83.80	360.0	7.729	10.10	23.92	16.02	45.78
Maximum:	31.59	80.65	365.0	7.830	10.24	24.36	16.96	47.39
Cof of Var:	1.73	3.00	.84	.72	.70	.93	2.85	1.73

Sample Identification: 100MRS

Test Date: 10 May 1999

Out of 3 specimens, 1 excluded.

Sample comments: 300FRY29 IN 0.5% OXALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1.0-3.0) (Kpsi)	STRESS @ 2% ELONG (F2) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	24.22	57.42	366.0	8.889	11.12	23.12	15.31	36.94
2	23.29	51.41	366.0	8.774	11.06	23.05	15.91	34.93
3	24.93	63.02	354.1	8.730	11.01	23.01	16.02	37.39
Mean:	24.15	57.28	362.0	8.798	11.06	23.06	15.75	36.22
Standard Deviation:	.82	5.80	6.9	.082	.06	.04	.30	1.24
Minimum:	23.29	51.41	354.1	8.730	11.01	23.01	15.31	34.93
Maximum:	24.93	63.02	366.0	8.889	11.12	23.12	16.02	37.39
Cof of Var:	3.41	10.13	1.89	.94	.51	.26	2.42	3.41

Sample Identification: 100HRS

Test Date: 10 May 1977

Out of 3 specimens, 0 excluded.

Sample comments: 300FMS29 IN 5.0% MALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1.0-3.0) (Kpsi)	STRESS @ 1% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG (F50) (Kpsi)	STRESS THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	22.08	46.12	354.1	8.566	10.74	-----	15.38	33.12
2	20.70	36.84	354.6	8.522	10.75	-----	15.40	31.06
3	21.47	41.34	366.0	8.581	10.82	-----	15.31	32.21
Mean:	21.42	41.43	358.0	8.556	10.77	-----	15.39	32.13
Standard Deviation:	.69	4.64	6.9	.031	.05	-----	.08	1.08
Minimum:	20.70	36.84	354.0	8.522	10.74	-----	15.31	31.06
Maximum:	22.08	46.12	366.0	8.581	10.82	-----	15.40	33.12
Cof of Var:	3.21	11.20	1.92	.36	.43	-----	.55	3.21

Sample Identification: 100NBS

Test Date: 10 May 1999

Out of 3 specimens, 0 excluded.

Sample comments: 500FM131 IN 0.5% OXALIC ACID SOLUTION @ ROOM TEMPERATURE

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER EIMS 1.0-9.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbf)
1	26.21	123.8	299.7	6.428	8.426	18.49	13.62	65.52
2	24.04	104.4	296.3	6.136	8.214	18.25	13.26	60.09
3	25.24	116.9	306.7	6.827	8.284	18.24	13.38	63.11
Mean:	25.16	115.0	300.9	6.297	8.308	18.32	13.42	62.91
Standard Deviation:	1.09	9.8	5.3	.148	.108	.14	.18	2.72
Minimum:	24.04	104.4	296.3	6.136	8.214	18.24	13.26	60.09
Maximum:	26.21	123.8	306.7	6.428	8.426	18.49	13.62	65.52
Cof of Var:	4.32	8.55	1.75	2.36	1.30	.78	1.37	4.32

Sample Identification: 100HRS

Test Date: 10 May 1999

Out of 3 specimens, 0 excluded.

Sample comments: 600FN131 EN 5.0% OXALIC ACID SOLUTION @ ROOM TEMPERATURE

Specimen Number	STRESS AT MAX. LOAD	% ELONG. AT MAX. LOAD	MODULUS (USER LINE 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 6% ELONG (F6)	STRESS @ 50% ELON (F50)	STRESS YIELD THRESHOLD	LOAD AT MAX. LOAD
	(Kpsi)	(%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbf)
1	25.52	118.0	297.5	6.377	8.375	18.27	13.46	63.80
2	25.48	118.9	306.5	6.072	8.164	18.28	13.54	63.69
3	25.72	121.6	308.2	6.378	8.376	18.24	13.18	64.30
Mean:	25.57	119.0	304.1	6.276	8.305	18.26	13.39	63.93
Standard Deviations:	.13	1.6	5.7	.176	.122	.02	.19	.22
Minimum:	25.48	118.8	297.5	6.072	8.164	18.24	13.18	63.69
Maximum:	25.72	121.6	308.2	6.378	8.376	18.28	13.54	64.30
Cof of Var:	.50	1.33	1.88	2.81	1.47	.12	1.42	.51

Sample Identification: 100HRS

Test Date: 10 May 1999

Out of 3 specimens, 0 excluded.

Sample comments: 500FR131 IN 0.5% OXALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 80% ELON G (F80) (Kpsi)	STRESS @THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	19.49	66.52	314.0	7.364	9.234	17.88	12.62	48.73
2	19.21	61.89	313.5	7.502	9.379	18.15	13.30	48.02
3	18.25	51.73	299.7	7.401	9.299	18.06	11.85	45.61
Mean:	18.98	59.78	309.1	7.422	9.304	18.03	12.59	47.46
Standard Deviation:	.63	7.48	8.2	.071	.072	.13	.72	1.43
Minimum:	18.25	51.73	299.7	7.364	9.234	17.88	11.85	45.61
Maximum:	19.49	66.52	314.0	7.502	9.379	18.15	13.30	48.73
Cof of Var:	3.44	12.51	2.64	.96	.78	.75	5.75	3.44

Sample Identification: 100HRS

Test Date: 10 May 1999

Out of 3 specimens, 0 excluded.

Sample comments: 500FN131 IN 5.0% OXALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (BASED LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 50% ELON G (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	17.00	38.04	313.8	7.429	9.312	-----	12.57	42.49
2	17.08	40.57	319.5	7.438	9.274	-----	11.33	42.69
3	17.24	42.72	310.1	7.410	9.276	-----	12.61	43.09
Mean:	17.10	40.71	314.4	7.426	9.287	-----	12.17	42.76
Standard Deviation:	.12	1.94	4.8	.014	.021	-----	.79	.31
Minimum:	17.04	38.04	310.1	7.410	9.274	-----	11.33	42.49
Maximum:	17.24	42.72	319.5	7.438	9.312	-----	12.61	43.09
Cof of Var:	.72	4.77	1.51	.19	.23	-----	6.01	.72

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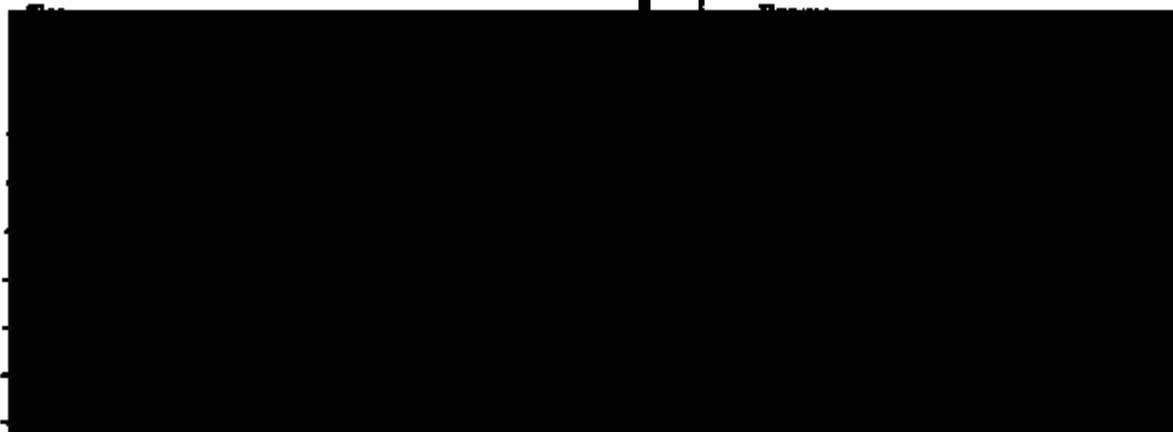
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REMARKS:

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Reply ASAP

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*BRIAN,
HERE ARE THE LATEST RESULTS ON THE
OXALIC ACID TESTING.*

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OXALIC ACID TEST AVGS.

300HN

	MODULUS			TENSIL			ELONG.								
	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.
CONTROL	451.2	38.29	84.81												
	ROOM TEMPERATURE									80 DEGREES C					
	0.5% SOLUTION			2.0% SOLUTION			5.0% SOLUTION			10% SOLUTION			15% SOLUTION		
160 HRL.	431.8	38.89	106.4	486.7	34.34	97.87	496.2	35.95	80.11	433.1	34.09	88.18			
500 HRL.	484.8	32.21	86.07	478.7	31.28	80.58	615.8	21.28	17.63	618.2	17.91	9.804			

DDMUTSA No. 1
00162

OXALIC ACID TEST AVGS.

300FN929

	ROOM TEMPERATURE			80 DEGREES D		
	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.
CONTROL	347.7	23.85	83.65			
	1% SOLUTION			5% SOLUTION		
	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.
100 HR.	343.7	31.21	94.35	342.3	31.05	88.97
500 HR.	392.8	30.08	85.80	388.2	31.31	91.78
	1% SOLUTION			5% SOLUTION		
	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.
				362	24.15	57.29
				400.1	18.78	19.88

DDNRTSA No. 1
00143

OXALIC ACID TEST AVGS.

500FN131

OXALIC ACID TEST AVGS.																
500FN131																
		MODULUS	TENSL	ELONG.												
CONTROL		317.5	25.2	112.9												
		ROOM TEMPERATURE						50 DEGREES C								
		0.5% SOLUTION				0.0% SOLUTION				0.5% SOLUTION				0.0% SOLUTION		
		MODULUS	TENSL	ELONG.		MODULUS	TENSL	ELONG.		MODULUS	TENSL	ELONG.		MODULUS	TENSL	ELONG.
100 HRS.		300.0	25.15	115		304.1	25.67	119.8		300.1	18.98	59.78		314.4	17.1	40.71
500 HRS.		327.4	25.78	111.7		330.1	25.3	107.5		341.2	14.83	16.5		345	13.83	13

DD FORM 131 No. 1
00144

Sample Identification: 500HRS

Test Date: 02 Jun 1999

Out of 3 specimens, 1 excluded.

Sample comments: 300MH IN 0.5% OXALIC ACID SOLUTION @ ROOM TEMPERATURE

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (FS) (Kpsi)	STRESS @ 6% ELONG (FS) (Kpsi)	STRESS @ 50% ELONG (FS0) (Kpsi)	STRESS THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	31.25	80.08	476.9	9.596	12.67	26.11	19.68	46.87
2	32.30	86.76	490.0	9.678	12.54	25.96	19.39	48.65
3	33.09	91.38	486.7	9.612	12.58	26.92	19.39	49.63
Mean:	32.21	86.07	484.5	9.592	12.56	26.00	19.48	48.32
Standard Deviation:	.92	5.60	6.8	.021	.02	.10	.17	1.39
Minimum:	31.25	80.08	476.9	9.570	12.54	25.92	19.39	46.87
Maximum:	33.09	91.38	490.0	9.611	12.58	26.11	19.68	49.63
Cof of Var:	2.87	6.60	1.40	.22	.15	.38	.07	2.87

Sample Identification: 50QPHS

Test Date: 02 Jun 1999

Out of 3 specimens, 0 excluded.

Sample comments: 3000R IN 5.0% OXALIC ACID SOLUTION @ ROOM TEMPERATURE

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON 6 (F50) (Kpsi)	STRESS @ YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	30.95	76.87	474.5	9.569	12.55	25.99	18.99	46.43
2	31.44	81.62	477.8	9.602	12.54	26.05	19.01	47.17
3	31.38	81.12	477.8	9.558	12.52	25.99	18.70	47.07
Mean:	31.26	80.53	476.7	9.577	12.54	26.01	19.17	46.89
Standard Deviation:	.27	1.46	1.9	.023	.02	.04	.58	.40
Minimum:	30.95	76.87	474.5	9.558	12.52	25.99	18.70	46.43
Maximum:	31.44	81.62 [*]	477.8	9.602	12.54	26.05	19.01	47.17
Cof of Var:	.86	1.82	.40	.24	.18	.14	3.02	.86

Sample Identification: 500RRS

Test Date: 02 Jun 1999

Out of 3 specimens, 0 excluded.

Sample comments: 306HM TK 0.5% GALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT MAX. LOAD (Kpa)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpa)	STRESS @ 3% ELONG (F3) (Kpa)	STRESS @ 5% ELONG (F5) (Kpa)	STRESS @ 50% ELON (F50) (Kpa)	STRESS @THRESHOLD YIELD (Kpa)	LOAD AT MAX. LOAD (lbs)
1	19.58	12.31	518.0	11.30	14.35	-----	18.93	29.37
2	22.15	28.89	515.8	11.16	14.23	-----	19.35	33.22
3	22.05	19.71	512.9	11.23	14.31	-----	19.45	33.87
Mean:	21.26	17.63	516.6	11.23	14.30	-----	19.24	31.89
Standard Deviation:	1.45	4.65	2.5	.07	.06	-----	.28	2.18
Minimum:	19.58	12.31	512.9	11.16	14.23	-----	18.93	29.37
Maximum:	22.15	28.89	518.0	11.30	14.35	-----	19.45	33.22
Cof of Var:	6.83	26.37	.49	.62	.45	-----	1.45	6.83

Sample Identification: 500HS

Test Date: 02 Jun 1999

Out of 3 specimens, 0 excluded.

Sample comments: 300HM IN 5.0% OXALIC ACID SOLUTION @ 90 DEGREES C.

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LINS 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELON (F50)	STRESS THRESHOLD YIELD	LOAD AT MAX. LOAD
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	17.78	9.168	519.6	11.85	14.69	-----	17.78	26.66
2	18.63	10.780	515.8	11.85	14.67	-----	18.63	27.94
3	17.32	8.559	519.6	11.85	14.67	-----	17.28	25.97
Mean:	17.91	9.504	518.3	11.85	14.68	-----	17.90	26.86
Standard Deviation:	.67	1.150	2.2	.00	.01	-----	.68	1.00
Minimum:	17.32	8.559	515.8	11.85	14.67	-----	17.28	25.97
Maximum:	18.63	10.780	519.6	11.85	14.69	-----	18.63	27.94
Cof of Var:	3.72	12.10	.42	.00	.04	-----	3.81	3.72

Sample Identification: 500HRS

Test Date: 02 Jun 1999

Out of 3 specimens, 0 excluded.

Sample comments: 300FM929 IN 0.5% OXALIC ACID SOLUTION @ ROOM TEMPERATURE

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1.0-9.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG (F50) (Kpsi)	STRESS YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	29.37	81.33	385.6	7.999	10.48	23.78	16.17	44.86
2	29.18	82.28	389.4	7.979	10.32	23.43	16.24	43.77
3	31.67	93.44	403.4	8.131	10.54	23.94	16.79	47.51
Mean:	30.06	85.69	392.8	8.033	10.42	23.72	16.41	45.11
Standard Deviation:	1.39	6.74	9.4	.085	.11	.26	.34	2.68
Minimum:	29.18	81.33	385.6	7.979	10.32	23.43	16.17	43.77
Maximum:	31.67	93.44	403.4	8.131	10.54	23.94	16.79	47.51
Cof of Var:	4.62	7.87	2.39	1.06	1.06	1.10	2.05	4.62

Sample Identification: 5068R5

Test Date: 02 Jun 1999

Out of 1 specimens, 0 excluded.

Sample comments: 306FM929 IN 5.4% SULFURIC ACID SOLUTION @ ROOM TEMPERATURE

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	31.31	91.79	398.2	8.053	10.46	23.78	17.51	46.97
Mean:	31.31	91.79	398.2	8.053	10.46	23.78	17.51	46.97
Standard Deviation:	-----	-----	-----	-----	-----	-----	-----	-----
Minimum:	31.31	91.79	398.2	8.053	10.46	23.78	17.51	46.97
Maximum:	31.31	91.79	398.2	8.053	10.46	23.78	17.51	46.97
Cof of Var:	-----	-----	-----	-----	-----	-----	-----	-----

Sample Identification: 50SRBS

Test Date: 02 Jun 1999

Out of 3 specimens, 0 excluded.

Sample comments: 300FK929 IN 0.5% OXALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON G (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	18.70	19.33	417.9	9.045	11.59	-----	15.87	28.04
2	19.19	22.07	421.6	9.126	11.63	-----	16.33	28.78
3	19.55	24.25	423.7	9.038	11.59	-----	15.44	29.32
Mean:	19.14	21.89	421.1	9.070	11.61	-----	15.95	28.72
Standard Deviation:	.43	2.46	2.9	.049	.02	-----	.35	.64
Minimum:	18.70	19.33	417.9	9.038	11.59	-----	15.44	28.04
Maximum:	19.55	24.25	423.7	9.126	11.63	-----	16.33	29.32
Cof of Var:	2.24	11.26	.70	.54	.21	-----	2.20	2.24

Sample Identification: 5008RS

Test Date: 02 Jun 1999

Out of 3 specimens, 0 excluded.

Sample comments: 200FW929 IN 5.0% OXALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	17.05	14.48	412.7	9.246	11.54	-----	15.28	25.58
2	16.13	12.26	409.8	9.271	11.57	-----	16.03	24.20
3	17.15	14.89	405.8	9.148	11.49	-----	16.00	25.73
Mean:	16.78	13.88	409.1	9.222	11.54	-----	15.77	25.17
Standard Deviation:	.56	1.41	3.9	.065	.04	-----	.43	.84
Minimum:	16.13	12.26	405.8	9.148	11.49	-----	15.28	24.20
Maximum:	17.15	14.89	412.7	9.271	11.57	-----	16.03	25.73
Cof of Var:	3.36	10.19	.94	.71	.37	-----	2.71	3.35

Sample Identification: 500HRS

Test Date: 02 Jun 1999

Out of 3 specimens, 0 excluded.

Sample comments: 500FM131 IN 0.5% OXALIC ACID SOLUTION @ ROOM TEMPERATURE

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	25.70	110.8	325.3	6.704	8.782	18.80	13.80	64.26
2	25.90	113.2	331.8	6.831	8.908	18.80	13.36	64.75
3	25.74	111.0	324.9	6.720	8.759	18.76	13.48	64.36
Mean:	25.74	111.7	327.4	6.752	8.816	18.79	13.55	64.46
Standard Deviation:	.10	1.3	3.8	.069	.081	.02	.22	.26
Minimum:	25.70	110.8	324.9	6.704	8.759	18.76	13.36	64.26
Maximum:	25.90	113.2	331.8	6.831	8.908	18.80	13.80	64.75
Cof of Var:	.40	1.20	1.17	1.02	.91	.12	1.64	.41

Sample Identification: 500HRS

Test Date: 02 Jun 1999

Out of 3 specimens, 0 excluded.

Sample comments: 500FR131 IN 5.0% OXALIC ACID SOLUTION @ ROOM TEMPERATURE

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	25.26	106.60	328.4	6.748	8.815	18.79	13.82	63.14
2	24.35	99.33	339.5	6.802	8.862	18.79	13.78	60.88
3	26.28	116.60	331.5	6.757	8.835	18.81	13.19	65.71
Mean:	25.30	107.50	334.7	6.769	8.837	18.80	13.60	63.24
Standard Deviation:	.97	8.68	1.6	.029	.023	.01	.35	2.42
Minimum:	24.35	99.33	328.4	6.748	8.815	18.79	13.19	60.88
Maximum:	26.28	116.60	331.5	6.802	8.862	18.81	13.82	65.71
Cof of Var:	3.82	8.98	.48	.43	.27	.05	2.60	3.82

Sample Identification: 500MS

Test Date: 02 Jun 1999

Out of 3 specimens, 0 excluded.

Sample comments: 500FN131 IN 0.5% OXALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS RTTHRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbf)
1	14.11	13.27	344.6	7.611	9.824	-----	13.13	35.28
2	14.82	16.12	337.9	7.518	9.699	-----	13.28	37.85
3	15.57	20.12	341.3	7.611	9.804	-----	13.09	38.93
Mean:	14.83	16.50	341.2	7.580	9.776	-----	13.17	37.09
Standard Deviation:	.73	3.44	3.3	.054	.067	-----	.10	1.82
Minimum:	14.11	13.27	337.9	7.518	9.699	-----	13.09	35.28
Maximum:	15.57	20.12	344.6	7.611	9.824	-----	13.28	38.93
Cof of Var:	4.92	20.83	.98	.71	.69	-----	.79	4.92

Sample Identification: 500HRS

Test Date: 02 Jun 1999

Out of 3 specimens, 0 excluded.

Sample comments: 500FKL31IN 5.0% OXALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS YIELD THRESHOLD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	14.23	14.50	344.6	7.831	9.838	-----	12.74	35.58
2	13.96	13.18	349.0	7.927	9.936	-----	12.18	34.89
3	13.29	11.32	341.4	7.911	9.937	-----	12.70	33.22
Mean:	13.83	13.00	345.2	7.890	9.903	-----	12.54	34.57
Standard Deviation:	.49	1.60	3.8	.051	.057	-----	.91	1.22
Minimum:	13.29	11.32	341.4	7.831	9.838	-----	12.18	33.22
Maximum:	14.23	14.50	349.0	7.927	9.937	-----	12.74	35.58
Cof of Var:	3.52	12.30	1.10	.65	.58	-----	2.46	3.52

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FAX

2372 hrs

Date: 8-13-99

Number of pages including cover sheet: 4

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BRIAN DAGUE

Phone:

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From:

JEFF WALISA

Phone: 740-474-0913

Fax phone: (740) 474-0244

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OXALIC ACID TEST AVGS.

300HN

	MODULUS	TENSIL	ELONG.	ROOM TEMPERATURE			IN DEGREE C						
				MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	
CONTROL	451.2	36.29	84.51										
100 HFB	431.9	36.58	105.4	438.7	34.34	97.67	499.2	28.86	80.11	433.1	34.00	96.16	
200 HFB	484.5	32.21	88.07	476.7	31.28	90.83	515.8	21.28	17.83	518.3	17.91	8.504	
1372 HFB	470.8	31.4	85.88	471	29.85	75.82	508.8	15.33	5.148	518.3	14.16	3.636	

OXALIC ACID TEST AVGS.

300FN929

	ROOM TEMPERATURE			IN DEGREE C								
	MODULUS	TENSL	ELONG.	0% SOLUTION			5% SOLUTION			10% SOLUTION		
	MODULUS	TENSL	ELONG.	MODULUS	TENSL	ELONG.	MODULUS	TENSL	ELONG.	MODULUS	TENSL	ELONG.
CONTROL	347.7	28.95	89.55									
100 HRS.	363.7	31.21	94.35	362.8	31.05	93.97	352	24.15	57.28	358	21.42	41.43
500 HRS.	392.5	30.08	85.59	386.2	31.31	91.75	421.1	19.14	21.89	409.1	16.75	13.58
2372 HRS.	382.8	27.77	78.82	382.2	26.75	74.83	421.1	12.83	5.311	422.8	12.85	5

OXALIC ACID TEST AVGS.

500FN131

	ROOM TEMPERATURE			IN DEGREES C								
	DILUTE SOLUTION			5.0% SOLUTION			2.0% SOLUTION			0.2% SOLUTION		
	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.
CONTROL	317.9	26.2	112.9									
100 HRS.	300.9	25.16	115	304.1	25.57	119.8	309.1	18.08	69.78	314.4	17.1	40.71
500 HRS.	327.4	28.78	111.7	330.1	35.3	107.5	341.2	14.83	18.5	345	13.83	15
2372 HRS.	321.7	23.48	99.38	323.5	21.75	82.07	345.8	9.841	4.988	355.1	10.07	4.134

IDENTIFSA No. 1
00168

Sample Identification: 2372HRS

Test Date: 13 Aug 1999

Out of 3 specimens, 0 excluded.

Sample comments: 305MM IN 0.5% OXALIC ACID SOLUTION @ ROOM TEMP.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 6% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	32.04	88.88	481.6	9.585	12.49	25.75	19.23	48.06
2	29.34	73.55	463.9	9.610	12.42	25.69	17.11	44.01
3	32.82	95.21	466.9	9.498	12.37	25.57	19.23	49.23
Mean:	31.40	85.88	475.8	9.531	12.43	25.67	18.52	47.10
Standard Deviation:	1.83	11.14	9.8	.047	.06	.09	1.22	2.74
Minimum:	29.34	73.55	463.9	9.498	12.37	25.57	17.11	44.01
Maximum:	32.82	95.21	481.6	9.585	12.49	25.75	19.23	49.23
Cof of Var:	5.81	12.97	2.01	.50	.48	.36	6.59	5.81

Sample Identification: 2372BR5

Test Date: 13 Aug 1999

Out of 3 specimens, 0 excluded.

Sample comments: 300HM IN 5.0% CALIC ACID SOLUTION @ ROOM TEMP.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON G (F50) (Kpsi)	STRESS @THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	30.14	76.75	473.8	9.566	12.47	25.78	19.34	45.21
2	31.21	85.24	466.9	9.321	12.42	25.62	19.44	46.82
3	28.19	65.46	472.3	9.349	12.49	25.81	18.92	42.28
Mean:	29.85	75.82	472.0	9.545	12.46	25.74	19.24	44.77
Standard Deviation:	1.53	9.92	3.6	.022	.04	.10	.28	2.30
Minimum:	28.19	65.46	466.9	9.321	12.42	25.62	18.92	42.28
Maximum:	31.21	85.24	473.8	9.566	12.49	25.81	19.44	46.82
Cof of Var:	5.14	13.09	.77	.24	.29	.40	1.44	5.14

Sample Identification: 2372HRS

Test Date: 13 Aug 1999

Out of 3 specimens, 0 excluded.

Sample comments: 300PM IN 0.5% OXALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	15.39	3.179	496.6	12.54	15.30	-----	15.39	23.09
2	15.88	6.058	512.7	12.55	15.29	-----	15.72	23.82
3	14.71	4.205	520.3	12.68	-----	-----	14.71	22.06
Mean:	15.33	4.48	512.9	12.59	-----	-----	15.27	22.99
Standard Deviation:	.59	.927	12.1	.68	-----	-----	.51	.88
Minimum:	14.71	4.205	496.6	12.54	-----	-----	14.71	22.06
Maximum:	15.88	6.058	520.3	12.68	-----	-----	15.72	23.82
Cof of Var:	3.84	18.01	2.38	.63	-----	-----	3.37	3.84

Sample Identification: 2372HRS

Test Date: 13 Aug 1999

Out of 3 specimens, 0 excluded.

Sample comments: 300HN IX 5.0% OXALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT	% ELONG. AT	ROD DLS (USER LINS 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELON G (F50)	STRESS @ THRESHOLD YIELD	LOAD AT MAX. LOAD
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbf)
1	13.83	3.436	519.8	12.85	-----	-----	13.73	20.74
2	13.89	3.513	513.2	12.79	-----	-----	13.83	20.84
3	14.77	3.959	522.7	12.98	-----	-----	14.77	22.15
Mean:	13.87	3.636	518.6	12.87	-----	-----	14.11	21.24
Standard Deviation:	.53	.282	4.8	.10	-----	-----	.57	.79
Minimum:	13.83	3.436	513.2	12.79	-----	-----	13.73	20.74
Maximum:	14.77	3.959	522.7	12.98	-----	-----	14.77	22.15
Cof of Var:	3.72	7.77	.92	.77	-----	-----	4.07	3.72

Sample Identification: 2372HE5

Test Date: 13 Aug 1999

Out of 3 specimens, 0 excluded.

Sample comments: 306FW929 IN 0.5% OXALIC ACID SOLUTION @ ROOM TEMP.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS YIELD THRESHOLD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	26.01	68.20	381.1	7.896	10.08	22.96	16.81	39.01
2	27.16	75.13	380.2	7.972	10.20	22.95	15.88	40.72
3	30.14	93.12	386.6	8.032	10.26	23.14	15.05	45.21
Mean:	27.77	78.82	382.6	7.967	10.18	23.02	15.89	41.65
Standard Deviation:	2.13	12.86	3.3	.068	.09	.11	.88	3.20
Minimum:	26.01	68.20	380.2	7.896	10.08	22.96	15.05	39.01
Maximum:	30.14	93.12	386.6	8.032	10.26	23.14	16.81	45.21
Cof of Var:	7.68	16.32	.91	.86	.86	.47	5.55	7.68

Sample Identification: 2372HRS

Test Date: 13 Aug 1999

Out of 3 specimens, 0 excluded.

Sample comments: 30QFR929 IN 5.0% OXALIC ACID SOLUTION @ ROOM TEMP.

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LIMS 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELON (F50)	STRESS @ YIELD	LOAD AT
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	MAX. LOAD (lbs)
1	27.60	80.58	386.6	8.006	10.23	22.82	17.04	41.40
2	25.49	67.64	373.4	7.924	10.15	22.75	16.39	38.23
3	27.18	76.27	386.6	8.047	10.27	23.05	15.64	40.77
Mean:	26.76	74.83	382.2	7.992	10.22	22.88	16.35	40.14
Standard Deviation:	1.12	6.59	7.6	.063	.06	.16	.70	1.68
Minimum:	25.49	67.64	373.4	7.924	10.15	22.75	15.64	38.23
Maximum:	27.60	80.58	386.6	8.047	10.27	23.05	17.04	41.40
Cof of Var:	4.18	8.81	2.00	.79	.62	.69	4.28	4.18

Sample Identification: 2372HRS

Test Date: 13 Aug 1999

Out of 3 specimens, 0 excluded.

Sample comments: 300FR929 IN 0.5% OXALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT MAX. LOAD	% ELONG. AT MAX. LOAD	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
	(Kpsi)	(%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	12.45	5.487	419.4	10.15	12.17	-----	12.42	18.48
2	13.75	7.862	424.5	10.25	12.34	-----	12.65	20.63
3	12.58	5.584	419.4	10.21	12.27	-----	12.58	18.87
Mean:	12.93	6.311	421.1	10.21	12.26	-----	12.55	19.39
Standard Deviation:	.72	1.344	2.9	.05	.08	-----	.12	1.07
Minimum:	12.45	5.487	419.4	10.15	12.17	-----	12.42	18.68
Maximum:	13.75	7.862	424.5	10.25	12.34	-----	12.65	20.63
Cof of Var:	5.54	21.29	.70	.48	.68	-----	.93	5.54

Sample Identification: 237ZHR5

Test Date: 13 Aug 1999

Out of 9 specimens, 0 excluded.

Sample comments: 300FM929 IN 5.0% OXALIC ACID @ 90 DEGREES C

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	12.91	5.887	424.4	10.30	12.41	-----	12.91	19.36
2	12.97	6.072	419.4	10.23	12.37	-----	12.68	19.46
3	12.97	6.042	424.5	10.26	12.39	-----	12.84	19.46
Mean:	12.95	6.000	422.0	10.27	12.39	-----	12.81	19.43
Standard Deviation:	.04	.100	2.9	.03	.02	-----	.12	.06
Minimum:	12.91	5.887	419.4	10.23	12.37	-----	12.68	19.36
Maximum:	12.97	6.072	424.5	10.30	12.41	-----	12.91	19.46
Cof of Var:	.29	1.66	.69	.32	.14	-----	.92	.29

Sample Identification: 2372HR6

Test Date: 13 Aug 1999

Out of 3 specimens, 0 excluded.

Sample comments: 800FN131 IN 0.5% OXALIC ACID SOLUTION @ ROOM TEMP.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON G (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	22.63	90.80	326.3	6.695	8.525	18.25	12.87	56.57
2	23.76	101.80	322.3	6.866	8.649	18.34	13.03	59.40
3	23.99	105.60	316.5	6.789	8.572	18.24	13.58	59.99
Mean:	23.46	99.98	321.7	6.783	8.582	18.27	13.16	58.65
Standard Deviation:	.73	7.67	5.0	.085	.063	.06	.37	1.83
Minimum:	22.63	90.80	316.5	6.695	8.525	18.24	12.87	56.57
Maximum:	23.99	105.60	326.3	6.866	8.649	18.34	13.58	59.99
Cof of Var:	3.11	7.72	1.54	1.26	.73	.36	2.80	3.11

Sample Identification: 23728R6

Test Date: 13 Aug 1999

Out of 3 specimens, 0 excluded.

Sample comments: 500FN131 IN 5.0% OXALIC ACID SOLUTION @ ROOM TEMP.

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LING 1.0-3.8)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELON G (F50)	STRESS @ THRESHOLD YIELD	LOAD AT MAX. LOAD
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	22.55	89.28	322.1	6.775	8.596	18.30	13.03	56.38
2	21.54	80.69	326.2	6.771	8.593	18.28	12.52	53.84
3	21.19	76.38	322.1	6.696	8.518	18.30	12.56	52.96
Mean:	21.75	82.07	323.5	6.747	8.569	18.26	12.71	54.39
Standard Deviation:	.71	6.56	2.3	.044	.044	.06	.28	1.77
Minimum:	21.19	76.38	322.1	6.696	8.518	18.28	12.52	52.96
Maximum:	22.55	89.28	326.2	6.775	8.596	18.30	13.03	56.38
Cof of Var:	3.26	8.00	.72	.65	.52	.32	2.22	3.26

Sample Identification: 2372HPS

Test Date: 13 Aug 1999

Out of 3 specimens, 0 excluded.

Sample comments: 500FNL31 IN 0.5% OXALIC ACID SOLUTION @ 90 DEGREE C

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	9.126	3.500	341.0	8.429	-----	-----	9.087	22.81
2	10.800	5.739	354.8	8.591	10.45	-----	10.760	27.01
3	9.594	3.923	341.0	8.449	-----	-----	9.555	23.98
Mean:	9.841	4.388	345.6	8.490	-----	-----	9.802	24.60
Standard Deviation:	.866	1.190	8.0	.089	-----	-----	.866	2.16
Minimum:	9.126	3.500	341.0	8.429	-----	-----	9.087	22.81
Maximum:	10.800	5.739	354.8	8.591	-----	-----	10.760	27.01
Cof of Var:	8.80	27.11	2.31	1.04	-----	-----	8.83	8.80

Sample Identification: 2372HRS

Test Date: 13 Aug 1999

Out of 3 specimens, 0 excluded.

Sample comments: 500FN131 IN 5.0% OXALIC ACID SOLUTION @ 90 DEGREES C

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LINS 1.0-3.0)	STRESS @ 3% ELONG (FS)	STRESS @ 5% ELONG (FS)	STRESS @ 50% ELON G (FS0)	STRESS @ THRESHOLD YIELD	LOAD AT MAX.LOAD
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	9.321	3.369	350.9	8.769	-----	-----	9.321	23.30
2	10.490	4.494	359.6	8.881	-----	-----	10.450	26.23
3	10.410	4.540	354.8	8.803	-----	-----	10.410	26.03
Mean:	10.070	4.124	355.1	8.818	-----	-----	10.060	25.19
Standard Deviation:	.654	.663	4.2	.057	-----	-----	.642	1.64
Minimum:	9.321	3.369	350.9	8.769	-----	-----	9.321	23.30
Maximum:	10.490	4.540	359.6	8.881	-----	-----	10.450	26.23
Cof of Var:	6.50	16.03	1.22	.65	-----	-----	6.38	6.50

FAX

3212 hrs

Date: 9-16-99

Number of pages including cover sheet: 4

To:

BRIAN DAGUE

From:

JEFF WALISA

REMARKS:

Urgent

For your review

Reply ASAP

Please comment

BRIAN,

HERE ARE THE LATEST DATA POINTS ON THE OXALIC ACID TEST SAMPLE. IN THE FUTURE, BILL CHAFFIN WILL BE RUNNING THE SAMPLES. I AM MOVING TO A NEW JOB ON SITE. HIS NUMBER WILL BE THE SAME, AS MINE.

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OXALIC ACID TEST AVGS.

300HN

	MODULUS	TENSIL	ELONG.	ROOM TEMPERATURE			60 DEGREES C		
				0.2% SOLUTION			5.0% SOLUTION		
	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.
CONTROL	451.2	36.28	84.91						
100 HRS.	431.9	35.58	105.4	438.7	34.34	87.67	439.2	28.95	60.11
600 HRS.	464.5	32.21	86.07	476.7	31.28	80.63	515.5	21.28	17.83
2072 HRS.	470.8	31.4	85.86	471	29.85	75.82	509.9	15.33	5.148
3212 HRS.	400.04	29.89	78.58	471	28.84	69.81	485.8	14.1	4.10

DOWNETSA No. 1
 08174

OXALIC ACID TEST AVGS.															
300FN929															
	MODULUS	TENSIL	ELONG.												
CONTROL	347.7	29.85	83.55												
	ROOM TEMPERATURE						95 DEGREE C								
	0.5% SOLUTION			1.0% SOLUTION			0.5% SOLUTION			1.0% SOLUTION					
	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.
100 HRS.	383.7	31.21	84.95	382.5	31.05	85.87	382	24.15	87.28	368	21.42	41.43			
500 HRS.	392.8	30.08	85.89	398.2	31.31	81.79	421.1	19.14	21.88	408.1	18.78	13.85			
2072 HRS.	382.8	27.77	78.82	382.2	28.78	74.83	421.1	12.85	8.311	422.8	12.95	6			
3312 HRS.	408.4	29.88	78.53	374.4	25.28	84.21	408.4	13.33	8.856	415.9	10.88	3.103			

OXALIC ACID TEST AVGS.

500FN131

	MODULUS	TENSL	ELONG.										
CONTROL	317.8	25.2	112.8										
	ROOM TEMPERATURE						89 DEGREE C						
	0.5% SOLUTION			6.0% SOLUTION			0.5% SOLUTION			6.0% SOLUTION			
	MODULUS	TENSL	ELONG.	MODULUS	TENSL	ELONG.	MODULUS	TENSL	ELONG.	MODULUS	TENSL	ELONG.	
100 HRS.	300.9	25.18	115	304.1	25.57	119.8	308.1	18.08	68.78	314.4	17.1	40.71	
500 HRS.	327.4	25.78	111.7	330.1	25.3	107.5	341.2	14.85	18.5	348	13.83	13	
2375 HRS.	321.7	23.48	99.38	323.5	21.78	82.07	345.9	9.841	4.388	355.1	10.07	4.134	
3242 HRS.	314.9	22.17	89.41	314.8	21.51	81.99	320.3	9.577	4.640	341.9	9.073	3.274	

DDPH/ISA No. 1
00176

Sample Identification: 200MMR

Test Date: 15 Sep 1999

3212 HES

Out of 3 specimens, 0 excluded.

Sample comments: 300MM 0.5% OXALIC ACID SOLUTION @ 90 DEG.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS #THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	15.00	4.780	482.7	12.42	-.0249	-----	15.00	22.50
2	13.17	3.354	489.0	12.40	-----	-----	13.17	19.76
3	14.73	4.434	488.1	12.44	-----	-----	14.73	22.10
Mean:	14.30	4.196	486.6	12.42	-----	-----	14.30	21.45
Standard Deviation:	.99	.744	3.4	.02	-----	-----	.99	1.48
Minimum:	13.17	3.354	482.7	12.40	-----	-----	13.17	19.76
Maximum:	15.00	4.780	489.0	12.44	-----	-----	15.00	22.50
Cof of Var:	6.89	17.75	.76	.16	-----	-----	6.89	6.89

Sample Identification: 20PWR
3212 HRS

Test Date: 15 Sep 1999

Out of 3 specimens, 0 excluded.

Sample comments: 30MIN 6.0% OXALIC ACID SOLUTION @ 90 DEG.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 6% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG (F50) (Kpsi)	STRESS AT THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	4.246	.8372	497.7	-----	-----	-----	4.246	6.369
2	12.870	3.0890	501.0	12.64	-----	-----	12.870	19.300
3	12.400	4.6070	419.5	10.37	-----	-----	12.370	18.610
Mean:	9.839	2.8450	472.7	-----	-----	-----	9.828	14.760
Standard Deviation:	4.849	1.8970	46.1	-----	-----	-----	4.841	7.274
Minimum:	4.246	.8372	419.5	-----	-----	-----	4.246	6.369
Maximum:	12.870	4.6070	501.0	-----	-----	-----	12.870	19.300
Cof of Var:	49.29	66.68	9.75	-----	-----	-----	49.25	49.29

E.I. DUPONT
 DUPONT ROAD
 CIRCLEVILLE, OH 43113

Sample Identification: ~~300FN~~

Test Date: 15 Sep 1999

Out of 3 specimens, 0 excluded.

3212 HR5

300FN 929

Gallic Acid

0.5% Solution

Rm Temp.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	25.77	62.95	388.0	7.910	10.34	23.48	15.02	38.65
2	30.34	90.20	353.7	7.737	10.20	23.44	16.85	45.51
3	28.62	77.37	400.8	8.233	10.67	23.98	16.91	42.93
Mean:	28.24	76.87	380.8	7.960	10.60	23.63	16.26	42.36
Standard Deviation:	2.91	13.67	24.4	.252	.24	.30	1.07	3.47
Minimum:	25.77	62.95	353.7	7.737	10.20	23.44	15.02	38.65
Maximum:	30.34	90.20	400.8	8.233	10.67	23.98	16.91	45.51
Cof of Var:	8.18	17.79	6.48	3.16	2.28	1.25	6.60	8.18

Sample Identification: 300HR

Test Date: 15 Sep 1999

Out of 3 specimens, 0 excluded.

Sample comments: 300HR 0.5% EXALIC ACID SOLUTION RM. TEMP.

3212 HR5

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	30.84	83.16	327.1	9.836	12.15	25.74	19.37	46.26
2	27.09	58.87	449.6	9.453	12.47	25.77	18.67	40.64
3	31.70	87.57	451.6	9.480	12.47	25.70	19.40	47.55
Mean:	29.88	76.53	409.4	9.323	12.36	25.74	19.14	44.82
Standard Deviation:	2.45	15.45	71.9	.249	.18	.03	.41	3.68
Minimum:	27.09	58.87	327.1	9.836	12.15	25.70	18.67	40.64
Maximum:	31.70	87.57	451.6	9.480	12.47	25.77	19.40	47.55
Cof of Var:	8.20	20.19	17.42	2.67	1.49	.13	2.15	8.20

Sample Identification: 2000MR

Test Date: 15 Sep 1999

3212 HRS

Out of 3 specimens, 0 excluded.

Sample comments: 300FM929 0.5% OXALIC ACID SOLUTION @ 90 DEG.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 60% ELON (F60) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	13.08	6.075	381.2	9.863	12.32	-----	12.97	19.60
2	14.09	7.917	433.5	10.380	12.57	-----	12.93	21.14
3	12.90	5.673	413.5	10.210	12.48	-----	12.90	19.35
Mean:	13.33	6.555	409.4	10.150	12.46	-----	12.93	20.00
Standard Deviation:	.66	1.197	26.4	.265	.13	-----	.03	.99
Minimum:	12.90	5.673	381.2	9.863	12.32	-----	12.90	19.35
Maximum:	14.09	7.917	433.5	10.380	12.57	-----	12.97	21.14
Cof of Var:	4.97	18.25	6.44	2.61	1.02	-----	.25	4.97

Sample Identification: 2092

Test Date: 15 Sep 1999

3212 HES.

Out of 3 specimens, 0 excluded.

Sample comments: 300FW929 5.0% OXALIC SOLUTION @ RM. TEMP.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	26.43	72.14	381.2	7.982	10.35	22.92	15.65	39.64
2	22.42	46.71	356.3	7.695	10.14	-----	15.78	33.63
3	26.93	73.78	385.5	8.831	10.43	23.22	16.45	44.39
Mean:	25.26	64.21	374.4	7.903	10.31	-----	15.96	37.89
Standard Deviation:	2.47	15.18	15.8	.181	.15	-----	.43	3.71
Minimum:	22.42	46.71	356.3	7.695	10.14	-----	15.65	33.63
Maximum:	26.93	73.78	385.5	8.831	10.43	-----	16.45	44.39
Cof of Var:	9.79	23.64	4.21	2.29	1.46	-----	2.67	9.79

Sample Identification: 20P2NR

Test Date: 15 Sep 1999

3212 HRS

Out of 3 specimens, 0 excluded.

Sample comments: 300HN 5.0% OXALIC ACID SOLUTION @ RM. TEMP.

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LIMS 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELONG (F50)	STRESS @ THRESHOLD YIELD	LOAD AT
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	MAX. LOAD (lbs)
1	30.14	79.90	481.3	9.646	12.54	25.67	19.17	45.21
2	28.49	69.80	456.1	9.578	12.49	25.50	19.53	42.73
3	27.29	59.14	475.6	9.728	12.65	25.87	19.66	40.94
Mean:	28.64	69.61	471.0	9.648	12.56	25.65	19.45	42.96
Standard Deviation:	1.43	10.38	13.2	.071	.08	.20	.26	2.15
Minimum:	27.29	59.14	456.1	9.578	12.49	25.50	19.17	40.94
Maximum:	30.14	79.90	481.3	9.728	12.65	25.87	19.66	45.21
Cof of Var:	5.00	14.92	2.80	.74	.66	.78	1.32	5.00

Sample Identification: 20P2NR

Test Date: 15 Sep 1999

3212 HRS

Out of 3 specimens, 0 excluded.

Sample comments: 300FN29 5% OXALIC ACID SOLUTION @ 90 DEG.

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LIMS 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELONG (F50)	STRESS @ THRESHOLD YIELD	LOAD AT
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	MAX. LOAD (lbs)
1	10.55	3.225	414.1	10.168	-----	-----	10.48	15.82
2	10.08	2.960	413.6	9.618	-----	-----	10.08	15.12
3	10.45	3.123	420.7	10.210	-----	-----	10.45	15.67
Mean:	10.36	3.103	415.9	9.995	-----	-----	10.34	15.54
Standard Deviation:	.24	.134	4.2	.328	-----	-----	.22	.37
Minimum:	10.08	2.960	413.6	9.618	-----	-----	10.08	15.12
Maximum:	10.55	3.225	420.7	10.210	-----	-----	10.48	15.82
Cof of Var:	2.36	4.30	1.01	3.28	-----	-----	2.14	2.36

Sample Identification: ~~4078R~~
 3212HR

Test Date: 15 Sep 1999

Out of 2 specimens, 0 excluded.

Sample comments: 500FNE31 0.5% OXALIC ACID SOLUTION AT RM. TEMP.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	21.53	82.39	315.8	6.740	8.693	18.22	12.26	53.84
2	22.81	96.43	313.9	6.513	8.540	18.16	13.46	57.02
Mean:	22.17	89.41	314.9	6.627	8.616	18.19	12.86	55.43
Standard Deviation:	.90	9.93	1.3	.160	.108	.04	.84	2.25
Minimum:	21.53	82.39	313.9	6.513	8.540	18.16	12.26	53.84
Maximum:	22.81	96.43	315.8	6.740	8.693	18.22	13.46	57.02
Cof of Var:	4.06	11.11	.42	2.42	1.26	.22	6.56	4.06

Sample Identification: 2073RR

Test Date: 15 Sep 1999

3212 NR

Out of 3 specimens, 0 excluded.

Sample comments: E00FM131 5.0% OXALIC ACID SOLUTION @ RM. TEMP.

Specimen Number	STRESS AT MAX. LOAD	% ELONG. AT MAX. LOAD	MODULUS (USER LIMS 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 10% ELONG (F10)	STRESS @ THRESHOLD YIELD	LOAD AT MAX. LOAD
	(Kpsi)	(%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	21.49	80.98	316.5	6.751	8.676	18.19	12.53	53.72
2	21.41	82.82	313.7	6.709	8.607	18.07	13.37	53.52
3	21.65	82.97	318.7	6.719	8.666	18.15	13.33	54.12
Mean:	21.51	81.99	314.6	6.726	8.649	18.13	13.08	53.79
Standard Deviation:	.12	.99	1.7	.022	.037	.06	.47	.30
Minimum:	21.41	80.98	313.7	6.709	8.607	18.07	12.53	53.52
Maximum:	21.65	82.97	316.5	6.751	8.676	18.19	13.37	54.12
Cof of Var:	.57	1.21	.53	.33	.43	.35	3.64	.57

Sample Identification: ~~000000~~

Test Date: 15 SEP 1999

3212 HRS

Out of 3 specimens, 0 excluded.

Sample comments: 500FM131 0.5% OXALIC ACID SOLUTION @ 90 DEG. C

Specimen Number	STRESS AT MAX. LOAD	% ELONG. AT MAX. LOAD	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON G (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
	(Kpsi)	(%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	10.190	4.348	341.0	8.899	-----	-----	10.150	25.47
2	8.436	3.016	329.4	8.408	-----	-----	8.436	21.09
3	10.110	4.783	329.4	8.279	-.2388	-----	10.110	25.27
Mean:	9.577	4.049	330.3	8.429	-----	-----	9.564	23.94
Standard Deviation:	.989	.920	10.3	.161	-----	-----	.977	2.47
Minimum:	8.436	3.016	329.4	8.279	-----	-----	8.436	21.09
Maximum:	10.190	4.783	341.0	8.899	-----	-----	10.150	25.47
Cof of Var:	10.32	22.73	3.12	1.91	-----	-----	10.21	10.32

Sample Identification: 2972HR

Test Date: 15 Sep 1999

3212 HRS

Out of 3 specimens, 0 excluded.

Sample comments: 500FN131 5.0% OXALIC ACID SOLUTION @ 90 DEG.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	8.635	3.007	334.4	8.623	-----	-----	8.556	21.59
2	9.749	3.696	350.4	8.778	-----	-----	9.710	24.37
3	8.834	3.119	341.6	8.667	-----	-----	8.834	22.09
Mean:	9.073	3.274	341.9	8.689	-----	-----	9.033	22.68
Standard Deviation:	.594	.370	8.0	.080	-----	-----	.682	1.49
Minimum:	8.635	3.007	334.4	8.623	-----	-----	8.556	21.59
Maximum:	9.749	3.696	350.4	8.778	-----	-----	9.710	24.37
Cof of Var:	6.55	11.29	2.34	.92	-----	-----	6.67	6.55

FAX

5036 hrs

Date: 12/2/99

Number of pages including cover sheet: 4

To:

Brian DAGUE

From:

Bill Chaffin

REMARKS:

Urgent

For your review

Reply ASAP

Please comment

Brian, here are the latest data points on the Oxalic Acid test samples. If you have any questions please advise.

*TKS
Bill Chaffin*

Should you occur problems while sending, contact 740-474-0491 or 740-474-0242

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OXALIC ACID TEST AVGS.

300HN

	MODULUS			TENSILE			ELONG.								
	MODULUS	TENSILE	ELONG.	MODULUS	TENSILE	ELONG.	MODULUS	TENSILE	ELONG.	MODULUS	TENSILE	ELONG.	MODULUS	TENSILE	ELONG.
CONTROL	451.2	98.28	84.91												
ROOM TEMPERATURE															
	0.5% SOLUTION			1.0% SOLUTION			2.0% SOLUTION			5.0% SOLUTION					
100 HRS.	431.9	95.88	105.4	435.7	94.94	97.57	439.2	88.86	90.11	433.1	24.08	38.15			
500 HRS.	484.6	92.21	85.07	476.7	91.28	80.83	515.6	21.28	17.83	518.3	17.91	9.604			
2372 HRS.	470.8	91.4	85.88	471	28.85	75.82	500.9	18.33	6.148	518.3	14.18	2.836			
2812 HRS.	408.04	28.88	78.83	471	28.84	86.61	488.8	14.5	4.18	472.7	9.839	2.845			
3008 hrs	381	27.83	98.71	518.2	89.48	74.05	378.9	12.59	4.875	367.5	3.012	4.181			

DDPHSA No. 1
00183

OXALIC ACID TEST AVGS.

300FN929

	MODULUS			TENSILE			ELONG.			ROOM TEMPERATURE			IN DEGREES C		
	MODULUS	TENSILE	ELONG.	MODULUS	TENSILE	ELONG.	MODULUS	TENSILE	ELONG.	MODULUS	TENSILE	ELONG.	MODULUS	TENSILE	ELONG.
CONTROL	347.7	23.85	85.85												
	100 HRS.			100 HRS.			100 HRS.			100 HRS.			100 HRS.		
	363.7	31.21	94.35	362.9	31.05	88.97	362	24.15	87.28	358	21.42	41.49			
	300 HRS.			300 HRS.			300 HRS.			300 HRS.			300 HRS.		
	362.8	30.06	88.58	398.2	31.31	91.78	421.1	19.14	21.88	409.1	18.79	18.88			
	2372 HRS.			2372 HRS.			2372 HRS.			2372 HRS.			2372 HRS.		
	362.6	27.77	78.92	382.2	28.75	74.83	421.1	12.93	6.311	422.8	12.95	6			
	2812 HRS.			2812 HRS.			2812 HRS.			2812 HRS.			2812 HRS.		
	408.4	28.58	78.53	374.4	28.28	64.21	408.4	18.83	6.555	416.9	10.36	3.103			
	5000 hrs			5000 hrs			5000 hrs			5000 hrs			5000 hrs		
	301.5	25.74	80.5	311.9	24.93	85.88	317.9	19.2	6.527	327	9	4.748			

EDMUNDA No. 1
80189

OXALIC ACID TEST AVGS.

500FN131

	ROOM TEMPERATURE			ROOM TEMPERATURE			IN DEGREE C			IN DEGREE C		
	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.
CONTROL	317.8	26.2	112.9									
NO HRS.	300.9	25.16	115	304.1	25.57	119.8	309.1	18.96	69.78	314.4	17.1	40.71
500 HRS.	327.4	26.79	111.7	330.1	26.9	107.6	341.2	14.89	19.6	346	13.83	13
2378 HRS.	321.7	23.46	99.39	328.6	21.78	83.07	346.8	9.941	4.398	355.1	10.07	4.194
3218 HRS.	314.9	22.17	89.41	314.8	21.51	81.60	330.3	9.677	4.046	341.8	9.979	8.274
6008 HRS.	221.3	18.51	100.1	238.9	18.35	93.49	262.9	0	6.7	284.6	9.533	4.336

DD FORM No. 1
90106

Sample Identification: 30021

Test Date: 07 Dec 1998

Out of 5 specimens, 0 excluded.

Sample comments: JONEN EN. TEMP. 0.5% OXALIC ACID

Specimen Number	Thickness (mil)	MODULUS (Kpsi)	TENSILE (Kpsi)	ELONGATION (%)	F-3 (Kpsi)	F-5 (Kpsi)	F-7 (Kpsi)
1	3.248	298.9	26.33	78.86	6.251	8.585	11.84
2	3.248	352.3	27.44	88.39	7.449	10.450	12.81
3	3.210	331.8	24.61	89.98	7.449	10.350	12.42
4	3.229	338.1	26.61	97.38	7.741	10.628	12.69
5	3.228	334.9	25.19	82.34	7.645	10.658	12.69
Mean:	3.226	331.8	27.83	88.71	7.367	10.338	12.45
Standard Deviation:	.013	28.0	.97	3.79	.687	.434	.36
Minimum:	3.210	298.9	24.61	78.86	6.251	8.585	11.84
Maximum:	3.248	352.3	28.61	99.96	7.845	10.450	12.69

Sample Identification: 300EH

Test Date: 07 Dec 1999

Out of 5 specimens, 0 excluded.

Sample comments: 300EH RH. TEMP. 5.0% OXALIC ACID

300EH

Specimen Number	Thickness (mil)	MODULUS (Kpsi)	TENSILE (Kpsi)	ELONGATION (%)	F-2 (Kpsi)	F-5 (Kpsi)	F-T (Kpsi)
1	3.240	341.2	26.86	74.75	7.935	10.77	12.60
2	3.240	339.7	26.81	80.16	7.788	10.61	12.66
3	3.180	347.1	25.68	88.38	7.792	10.76	12.88
4	3.180	237.6	25.10	61.40	7.860	10.81	12.50
5	3.220	326.2	28.00	87.54	7.560	10.50	12.70
Mean:	3.216	318.2	26.43	74.85	7.623	10.69	12.71
Standard Deviation:	.025	45.7	1.13	10.47	.342	.19	.15
Minimum:	3.180	237.6	25.10	61.40	7.860	10.81	12.50
Maximum:	3.240	347.1	28.00	87.54	7.935	10.77	12.80

Sample Identification: 3001B

Test Date: 07 Dec 1999

Out of 5 specimens, 9 excluded.

Sample comments: 3001B IN 0.3% ORALIC ACID 5038 HOURS

90°C

Specimen Number	Thickness (mil)	MODULUS (Kpsi)	TENSILE (Kpsi)	ELONGATION (%)	F-3 (Kpsi)	F-5 (Kpsi)	F-7 (Kpsi)
1	3.350	364.0	10.04	3.235	9.904	-----	-----
2	3.230	373.0	14.10	6.225	9.993	13.2400	.0000
3	3.350	371.4	14.60	6.720	10.020	13.3000	.1205
4	3.230	380.4	13.41	4.765	10.250	2.7160	-----
5	3.260	380.4	10.07	3.610	10.110	-.0150	-----
Mean:	3.234	373.3	12.56	4.675	10.050	-----	-----
Standard Deviation:	.034	10.5	2.07	1.507	.101	-----	-----
Minimum:	3.230	364.0	10.04	3.230	9.904	-----	-----
Maximum:	3.350	380.4	14.50	6.720	10.250	-----	-----

Sample Identification: 30007

Test Date: 07 Dec 1999

Out of 5 specimens, 0 excluded.

Sample comments: 30007 IS 5% CITRIC ACID 5036 10029

90°C

Specimen Number	Thickness (mil)	MODULUS (Kpsi)	TENSILE (Kpsi)	ELONGATION (%)	F-3 (Kpsi)	F-5 (Kpsi)	F-7 (Kpsi)
1	3.340	392.2	11.230	3.767	10.0500	-.0076	-----
2	3.340	381.0	8.157	2.614	.3832	-----	-----
3	3.340	398.4	10.800	3.450	9.0270	.0152	-----
4	3.340	298.2	8.618	2.746	.4086	-.0076	-----
5	3.340	405.5	8.487	2.678	.1744	-----	-----
Mean:	3.340	387.5	9.450	3.012	4.1810	-----	-----
Standard Deviation:	.000	12.0	1.440	.567	5.2040	-----	-----
Minimum:	3.340	298.2	8.157	2.476	.1744	-----	-----
Maximum:	3.340	405.5	11.230	3.767	10.0500	-----	-----

Sample Identification: 3007K929

Test Date: 07 Dec 1989

Out of 5 specimens, 0 excluded.

Sample comments: 3007K929 EN. TEMP. 0.5% GALIC ACID

Specimen Number	Thickness (mil)	MODULUS (Kpsi)	TENSILE (Kpsi)	ELONGATION (%)	F-3 (Kpsi)	F-5 (Kpsi)	F-7 (Kpsi)
1	3.189	309.0	26.35	80.95	6.898	8.827	10.28
2	3.183	277.3	23.28	71.84	6.507	8.719	10.16
3	3.180	302.4	25.52	84.87	6.222	8.685	10.22
4	3.189	312.6	25.69	87.93	6.964	8.978	10.45
5	3.089	314.6	27.85	100.00	7.221	9.153	10.62
Mean:	3.128	301.6	25.74	89.50	6.733	8.867	10.35
Standard Deviation:	.048	14.9	1.71	13.77	.382	.761	.18
Minimum:	3.089	277.3	23.28	71.84	6.222	8.685	10.16
Maximum:	3.189	314.6	27.85	100.00	7.221	9.153	10.62

CINCINNATI RESEARCH LABORATORY
 PHYSICAL TESTING LAB
 METHOD 1 1"CH #1122*

Sample Identification: 280F8329

Test Date: 07 Dec 1958

Out of 5 specimens, 0 excluded.

Sample comments: 280F8329 RM. TEMP. 5.0% OXALIC ACID

Specimen Number	Thickness (all)	MODULUS (Kpsi)	TENSILE (Kpsi)	ELONGATION (%)	T-3 (Kpsi)	T-5 (Kpsi)	T-7 (Kpsi)
1	3.269	306.0	22.30	66.64	6.969	8.857	10.16
2	3.240	306.4	24.27	81.28	6.830	8.768	10.21
3	3.240	291.1	24.32	80.89	6.479	8.547	10.00
4	3.180	305.3	24.63	78.52	7.129	8.820	10.46
5	3.180	311.9	24.93	86.18	7.823	8.948	10.30
Mean:	3.216	304.5	24.12	79.65	6.889	8.820	10.27
Standard Deviation:	.033	8.6	1.00	7.50	.264	.184	.10
Minimum:	3.180	291.1	22.30	66.60	6.479	8.547	10.00
Maximum:	3.240	311.9	24.93	86.98	7.129	8.820	10.46

Sample Identification: 30078929

Test Date: 07 Dec 1987

Out of 5 specimens, 3 excluded.

Sample comments: 30078929 IN 0.5 OXALIC ACID 5000 HOURS

90°C

Specimen Number	Thickness (mil)	MODULUS (Kpsi)	TENSILE (Kpsi)	ELONGATION (%)	F-0 (Kpsi)	F-1 (Kpsi)	F-7 (Kpsi)
1	3.209	277.7	11.45	8.120	8.559	10.36	1.2820
2	3.200	331.6	13.26	9.723	9.781	11.56	12.8500
3	3.160	332.5	15.53	14.869	9.907	11.77	12.8000
4	3.160	328.0	13.84	8.185	9.838	11.88	12.9500
5	3.200	325.9	12.82	6.832	8.787	11.60	.7385
Mean:	3.196	317.6	13.20	8.527	8.890	11.60	8.1240
Standard Deviation:	.041	22.8	1.53	3.201	.103	.61	6.4480
Minimum:	3.160	277.7	11.45	6.120	8.550	10.36	.7385
Maximum:	3.200	332.5	15.53	14.869	9.938	11.88	12.9500

Sample Identification: 30078924

Test Date: 07 Dec 1959

Out of 5 specimens, 0 excluded.

Sample contents: 30078924 IN 5% OXALIC ACID 6000 HOURS

90°C

Specimen Number	Thickness (mil)	MODULUS (Kpsi)	TENSILE (Kpsi)	ELONGATION (%)	F-3 (Kpsi)	F-5 (Kpsi)	F-7 (Kpsi)
1	3.300	321.0	10.05	5.074	0.127	10.310	1.504
2	3.300	324.6	-----	4.972	0.254	7.860	1.471
3	3.230	300.0	10.55	4.425	0.556	1.474	1.445
4	3.230	300.0	-----	4.052	0.611	1.489	1.489
5	3.230	343.1	11.62	5.223	0.672	11.570	1.405
Mean:	3.250	327.0	-----	4.740	0.444	6.642	1.401
Standard Deviation:	.080	14.2	-----	.491	.230	4.910	.023
Minimum:	3.230	300.0	-----	4.052	0.127	1.474	1.445
Maximum:	3.300	343.1	-----	5.223	0.672	11.570	1.504

CINCINNATI RESEARCH LABORATORY
 PHYSICAL TESTING LAB
 METHOD 1 1"CH #1122c

Sample Identification: 500FH131

Test Date: 17 Dec 1990

Out of 5 specimens, 0 excluded.

Sample comments: 500FH131 RM. TEST 0.5% GALIC ACID

Specimen Number	Thickness (mil)	MODULUS (Kpsi)	TENSILE (Kpsi)	ELONGATION (%)	F-3 (Kpsi)	F-5 (Kpsi)	F-7 (Kpsi)
1	5.500	220.6	20.40	127.5	5.404	6.830	8.024
2	5.500	220.4	20.20	125.9	5.270	6.874	7.965
3	5.400	232.2	20.70	129.5	5.520	7.800	8.190
4	5.400	230.2	19.57	111.2	5.347	6.957	8.077
5	5.500	221.9	20.51	100.1	4.417	6.510	7.602
Mean:	5.544	224.8	19.90	118.8	5.193	6.874	7.891
Standard Deviation:	.040	5.7	.60	12.7	.444	.210	.106
Minimum:	5.400	220.4	18.51	100.1	4.417	6.510	7.602
Maximum:	5.500	232.2	20.70	129.5	5.520	7.800	8.190

Sample Identification: 5007N131

Test Date: 07 Dec 1990

Out of 5 specimens, 0 excluded.

Sample comments: 5007N131 RE. TEMP. 5.0% OXALIC ACID

Specimen Number	Thickness (mil)	TENSILE (Kpsi)	TENSILE (Kpsi)	ELONGATION (%)	P-3 (Kpsi)	P-5 (Kpsi)	P-7 (Kpsi)
1	5.517	236.0	18.01	89.37	5.517	7.112	8.221
2	5.510	225.0	18.85	101.30	5.485	7.013	8.107
3	5.500	224.4	18.28	95.20	5.500	7.805	8.988
4	5.500	224.3	18.95	75.29	5.478	6.990	8.087
5	5.439	233.9	18.73	95.22	5.647	7.204	8.312
Mean:	5.522	228.9	18.35	93.49	5.527	7.065	8.163
Standard Deviation:	.002	5.4	.20	10.50	.050	.091	.100
Minimum:	5.430	224.2	18.95	75.29	5.478	6.990	8.087
Maximum:	5.500	233.9	18.85	101.30	5.647	7.204	8.312

Sample Identification: 60NPH131

Test Date: 27 Dec 1991

Out of 5 specimens, 0 excluded.

Sample comments: 60NPH131 IN 0.5 OXALIC ACID 5036 HOURS

90°C

Specimen Number	Thickness (mil)	TENSILE (Kpsi)	TENSILE (Kpsi)	ELONGATION (%)	F-3 (Kpsi)	F-5 (Kpsi)	F-7 (Kpsi)
1	5.439	261.7	10.220	6.196	7.116	9.557	1.2150
2	4.520	285.5	11.760	5.949	8.135	11.050	.8378
3	5.500	261.2	-----	4.072	7.993	1.393	1.3260
4	5.670	249.2	10.020	7.042	6.606	9.019	8.4470
5	5.440	255.6	9.584	5.250	7.033	9.516	1.2260
Mean:	5.312	262.9	-----	5.709	7.196	8.009	2.6128
Standard Deviation:	.459	20.2	-----	1.113	.364	3.009	3.2570
Minima:	4.520	249.2	-----	4.072	6.606	1.393	.8378
Maxima:	5.670	285.5	-----	7.042	8.135	11.050	8.4470

Sample Identification: 500FW131

Test Date: 07 Dec 1999

Out of 5 specimens, 0 excluded.

Sample comments: 500FW131 IN 6X OXALIC ACID 5636 HOURS

90 °C

Specimen Number	Thickness (mil)	MODULUS (Kpsi)	TENSILE (Kpsi)	ELONGATION (%)	F-3 (Kpsi)	F-5 (Kpsi)	F-7 (Kpsi)
1	5.500	251.1	-----	3.000	6.721	1.403	1.4191
2	5.480	269.1	7.200	3.402	6.935	1.290	1.3770
3	5.400	229.5	7.360	3.394	6.253	1.417	1.4110
4	5.430	257.3	7.702	3.830	6.844	1.400	.0793
5	5.470	264.6	8.532	4.338	6.902	1.461	1.4530
Mean:	5.456	252.7	-----	3.003	6.748	1.417	1.1000
Standard Deviation:	.029	19.0	-----	.236	.295	.426	.5052
Minimum:	5.400	229.5	-----	3.402	6.253	1.306	.0793
Maximum:	5.500	264.6	-----	4.335	6.902	1.461	1.4530

OXALIC ACID TEST AVGS.															
300HN															
	MODULUS	TENSL	ELONG.												
CONTROL	481.2	38.20	84.81												
ROOM TEMPERATURE							AS DESIRED C								
	5% SOLUTION			5% SOLUTION			5% SOLUTION			5% SOLUTION					
	MODULUS	TENSL	ELONG.	MODULUS	TENSL	ELONG.	MODULUS	TENSL	ELONG.	MODULUS	TENSL	ELONG.	MODULUS	TENSL	ELONG.
100 HRB.	491.8	35.58	105.4	438.7	34.34	87.57	498.2	28.85	80.11	433.1	24.00	38.15			
300 HRB.	484.5	32.21	88.07	478.7	31.28	80.63	615.8	21.28	17.83	518.3	17.81	9.604			
2372 HRB.	470.8	31.4	86.88	471	28.85	78.82	508.9	15.35	5.148	518.3	14.18	3.638			
2212 HRB.	402.04	28.88	78.53	471	28.84	89.81	488.8	14.3	4.18	472.7	8.838	2.845			
400 HRB.	331	27.83	89.71	318.2	26.43	74.06	378.9	12.68	4.875	367.5	9.012	4.151			
652 HRB.	453.8	28.82	88.28	484.1	25.5	48.37	508.3	14.8	4.178	488.2	7.452	1.708			

500 FN131 - 5.0% OXALIC ACID SOLUTION
 90 °C samples Failed.

OXALIC ACID TEST AVGS.

300FN92B

	ROOM TEMPERATURE			ROOM TEMPERATURE			80 DEGREES C			80 DEGREES C		
	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.
CONTROL	347.7	23.85	88.88									
100 HRS.	383.7	31.21	84.38	382.3	31.05	88.87	382	24.15	87.28	358	21.42	41.43
800 HRS.	392.8	30.08	85.89	388.2	31.31	81.78	421.1	19.74	21.88	408.1	18.78	13.88
2372 HRS.	382.8	27.77	78.82	382.2	28.78	74.83	421.1	12.93	8.311	422.8	12.93	0
3212 HRS.	409.4	29.88	78.53	374.4	28.28	84.21	409.4	13.33	8.335	415.8	10.36	3.183
5628 HRS.	301.8	26.74	80.5	311.9	24.83	88.88	317.6	13.2	8.527	327	0	4.740
8634 HRS.	385.7	28.84	78.41	378.8	22.57	44.47	451.9	13.98	3.988	0	0.208	0.0858

DINTESTA No. 1
8/2/84

OXALIC ACID TEST AVGS.

500FN131

	ROOM TEMPERATURE			97 DEGREES C								
	MODULUS	TENSIL	ELONG.	5% SOLUTION			10% SOLUTION			5% SOLUTION		
	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.
CONTROL	317.8	25.2	112.8									
108 HRS.	300.8	25.16	115	304.1	25.57	118.8	300.1	18.88	58.78	314.4	17.1	40.71
308 HRS.	327.4	25.78	111.7	330.1	25.3	107.5	341.2	14.83	18.5	345	13.83	13
2372 HRS.	321.7	23.48	83.38	323.5	21.78	82.07	345.8	8.841	4.388	358.1	10.07	4.134
3212 HRS.	314.8	22.17	88.41	314.5	21.61	81.88	330.3	8.877	4.048	341.8	8.073	3.274
3288 HRS.	221.3	18.51	100.1	228.8	18.35	93.48	282.8	0	5.7	264.8	8.533	4.338
8024 HRS.	317.3	22.43	88.57	302.8	18.72	84.05	378.5	8.888	2.588	Failed	Failed	Failed

DDPHITSA No. 1
06285

Sample Identification: 1

Test Date: 19 Jan 1980

Out of 3 specimens, 0 excluded.

Sample comments: 300HM OXALIC ACID .05 6524HRS

Rm. TEMP

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG (F50) (Kpsi)	STRESS @ YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	31.56	84.54	469.5	9.784	12.87	26.13	19.86	47.34
2	26.40	52.18	452.4	9.741	12.80	26.07	19.03	39.60
3	27.91	62.06	469.5	9.839	12.84	26.07	20.02	41.86
Mean:	28.62	66.26	463.8	9.788	12.84	26.09	19.64	42.93
Standard Deviation:	2.65	16.58	9.9	.049	.04	.04	.53	3.98
Minimum:	26.40	52.18	452.4	9.741	12.80	26.07	19.03	39.60
Maximum:	31.56	84.54	469.5	9.839	12.87	26.13	20.02	47.34
Cof of Var:	9.27	25.02	2.13	.50	.28	.14	2.69	9.27

Sample Identification: 1

Test Date: 19 Jan 1980

Out of 3 specimens, 0 excluded.

Sample comments: ROOM TEMP. 5.0 OXALIC ACID 300HR 6524 HRS.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON G (F50) (Kpsi)	STRESS @ YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	26.76	56.52	461.2	9.838	12.86	25.79	19.40	40.14
2	24.23	37.57	469.8	9.874	12.89	-----	19.59	36.34
3	25.51	45.03	461.2	9.879	12.95	-----	19.13	38.26
Mean:	25.50	46.37	464.1	9.863	12.90	-----	19.37	38.25
Standard Deviation:	1.27	9.55	4.9	.023	.04	-----	.23	1.90
Minimum:	24.23	37.57	461.2	9.838	12.86	-----	19.13	36.34
Maximum:	26.76	56.52	469.8	9.879	12.95	-----	19.59	40.14
Cof of Var:	4.96	20.59	1.07	.23	.34	-----	1.19	4.96

Sample Identification: 1

Test Date: 19 Jan 1980

Out of 3 specimens, 2 excluded.

Sample comments: 90 DEG. 0.5 OXALIC ACID 300MM 6524 HRS.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1.0-3.0) (Kpsi)	STRESS @ 2% ELONG (F2) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON G (F50) (Kpsi)	STRESS YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	13.58	3.427	511.1	12.62	-----	-----	13.58	20.36
2	15.45	4.924	486.7	12.42	8.990	-----	15.45	23.18
3	14.76	4.176	517.9	12.63	-----	-----	14.69	22.14
Mean:	14.60	4.176	505.3	12.56	-----	-----	14.57	21.89
Standard Deviation:	.95	.748	16.4	.12	-----	-----	.94	1.42
Minimum:	13.58	3.427	486.7	12.42	-----	-----	13.58	20.36
Maximum:	15.45	4.924	517.9	12.63	-----	-----	15.45	23.18
Cof of Var:	6.49	17.93	3.25	.94	-----	-----	6.47	6.49

Sample Identification: 1

Test Date: 19 Jan 1980

Out of 3 specimens, 0 excluded.

Sample comments: 90 DEG. 5.0 OXALIC ACID 30MM 6520MS

Specimen Number	STRESS AT MAX. LOAD	% ELONG. AT MAX. LOAD	MODULUS (USER LINS 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELON (F50)	STRESS @ YIELD YIELD	LOAD AT MAX. LOAD
	(Kpsi)	(%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	8.646	2.203	419.5	.2301	-----	-----	8.514	12.970
2	6.279	1.270	511.7	-----	-----	-----	6.180	9.418
3	7.462	1.653	467.4	-----	-----	-----	7.462	11.190
Mean:	7.462	1.789	466.2	-----	-----	-----	7.385	11.190
Standard Deviation:	1.183	.469	46.1	-----	-----	-----	1.169	1.775
Minimum:	6.279	1.270	419.5	-----	-----	-----	6.180	9.418
Maximum:	8.646	2.203	511.7	-----	-----	-----	8.514	12.970
Cof of Var:	15.86	27.45	9.89	-----	-----	-----	15.83	15.86

Sample Identification: 1

Test Date: 19 Jan 1960

Out of 3 specimens, 0 excluded.

Sample comments: ROOM TEMP. 0.5 OXALIC ACID 300FH929 6524 HRS

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LIMS 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELON (F50)	STRESS @ YIELD	LOAD AT
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	MAX. LOAD (lbs)
1	26.24	89.23	380.1	8.029	10.50	23.36	16.60	42.36
2	25.51	62.24	391.3	8.098	10.53	23.51	16.37	38.26
3	26.76	60.75	334.9	7.792	10.43	23.69	17.32	40.14
Mean:	26.84	70.41	368.7	7.973	10.49	23.52	16.77	40.25
Standard Deviation:	1.37	9.11	29.8	.161	.85	.17	.50	2.85
Minimum:	25.51	62.24	334.9	7.792	10.43	23.36	16.37	38.26
Maximum:	26.24	89.23	391.3	8.098	10.53	23.69	17.32	42.36
Cof of Var:	5.09	12.94	8.09	2.01	.51	.70	2.97	5.09

Sample Identification: 1

Test Date: 19 Jan 1980

Out of 3 specimens, 0 excluded.

Sample comments: ROOM TEMP. 5.0 OXALIC ACID 380FH929 4524 HRS.

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LINS 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELONG (F50)	STRESS @ THRESHOLD YIELD	LOAD AT MAX. LOAD
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	22.82	40.81	377.7	8.107	10.62	-----	16.11	33.04
2	24.13	54.57	384.4	8.094	10.56	23.41	15.91	36.19
3	21.56	38.02	377.7	8.044	10.57	-----	16.50	32.35
Mean:	22.57	44.47	379.9	8.082	10.58	-----	16.17	33.06
Standard Deviation:	1.37	8.86	3.8	.023	.03	-----	.30	2.06
Minimum:	21.56	38.02	377.7	8.044	10.56	-----	15.91	32.35
Maximum:	24.13	54.57	384.4	8.107	10.62	-----	16.50	36.19
Cof of Var:	6.06	19.92	1.01	.41	.32	-----	1.86	6.06

Sample Identification: 1

Test Date: 19 Jan 1980

Out of 3 specimens, 0 excluded.

Sample comment: 90 BEG. O,3 OXALIC ACID 300F7929 6524 HRS.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LENS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	15.75	5.147	511.1	12.64	15.64	-----	15.71	23.62
2	12.82	3.260	425.6	12.17	-----	-----	12.69	19.23
3	19.31	3.558	419.1	11.90	-----	-----	19.31	19.97
Mean:	13.96	3.980	451.9	12.26	-----	-----	13.91	20.94
Standard Deviation:	1.57	1.014	51.4	.34	-----	-----	1.60	2.35
Minimum:	12.82	3.260	419.1	11.90	-----	-----	12.69	19.23
Maximum:	15.75	5.147	511.1	12.64	-----	-----	15.71	23.62
Cof of Var:	11.22	25.43	11.37	2.76	-----	-----	11.40	11.22

Sample Identification: 1

Test Date: 19 Jan 1969

Out of 3 specimens, 0 excluded.

Sample comments: 90 DEG. 5.0 OXALIC ACID 300FM929 6524HRS.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	1.972	.7934	-----	-----	-----	-----	1.972	4.931
2	1.657	.8666	-----	.3858	.0000	-----	1.657	4.142
3	1.578	.7354	-----	.6243	.6312	-----	1.578	3.945
Mean:	1.736	.7985	-----	-----	-----	-----	1.736	4.339
Standard Deviation:	.209	.0658	-----	-----	-----	-----	.209	.522
Minimum:	1.578	.7354	-----	-----	-----	-----	1.578	3.945
Maximum:	1.972	.8666	-----	-----	-----	-----	1.972	4.931
Cof of Var:	12.03	8.24	-----	-----	-----	-----	12.03	12.03

Sample Identification: 1

Test Date: 19 Jan 1980

Out of 3 specimens, 0 excluded.

Sample comments: ROOM TEMP. 0.5 OXALIC ACID 500FN131 6626 HRS

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-9.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	22.49	89.82	319.5	6.953	8.913	18.43	13.57	56.21
2	22.29	88.27	325.4	6.904	8.864	18.36	12.90	55.72
3	22.52	90.63	307.0	6.743	8.764	18.41	12.43	56.31
Mean:	22.43	89.57	317.3	6.867	8.847	18.40	12.97	56.08
Standard Deviation:	.13	1.20	9.4	.110	.076	.04	.57	.32
Minimum:	22.29	88.27	307.0	6.743	8.764	18.36	12.43	55.72
Maximum:	22.52	90.63	325.4	6.953	8.913	18.43	13.57	56.31
Cof of Var:	.57	1.34	2.96	1.60	.86	.20	4.43	.57

Sample Identification: 1

Test Date: 19 Jan 1980

Out of 3 specimens, 0 excluded.

Sample comments: ROOM TEMP. 5.0 OXALIC ACID 500FW131 6524 HRS

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	16.84	35.29	313.8	6.765	8.765	-----	13.10	42.11
2	19.88	65.28	269.2	6.399	8.518	10.29	13.37	49.70
3	19.45	61.57	325.4	6.860	8.803	10.24	12.62	48.62
Mean:	18.72	64.05	302.8	6.675	8.695	-----	13.06	46.81
Standard Deviation:	1.64	16.35	29.7	.243	.155	-----	.39	4.11
Minimum:	16.84	35.29	269.2	6.399	8.518	-----	12.62	42.11
Maximum:	19.88	65.28	325.4	6.860	8.803	-----	13.37	49.70
Cof of Var:	8.77	30.25	9.80	3.65	1.78	-----	2.98	8.77

Sample Identification: 1

Test Date: 19 Jan 1980

Out of 3 specimens, 0 excluded.

Sample comments: 90 DEG. 0.5 OXALIC ACID 500FPL31 6520HRS.

Specimen Number	STRESS AT MAX. LOAD	% ELONG. AT MAX. LOAD	MODULUS (USER LTMS 1.0-3.0) (Kpsi)	STRESS @ 1% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS @ THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
	(Kpsi)	(%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	3.787	1.679	231.1	-----	-----	-----	3.649	9.467
2	10.690	2.460	455.8	7.401	-----	-----	10.530	26.730
3	13.690	3.655	442.4	12.310	-----	-----	13.610	34.220
Mean:	9.389	2.598	376.5	-----	-----	-----	9.270	23.470
Standard Deviation:	5.077	.995	126.1	-----	-----	-----	5.489	12.690
Minimum:	3.787	1.679	231.1	-----	-----	-----	3.649	9.467
Maximum:	13.690	3.655	455.8	-----	-----	-----	13.610	34.220
Cof of Var:	54.08	38.31	33.49	-----	-----	-----	64.90	54.08

OXALIC ACID TEST AVGS.															
300HN															
	MODULUS	TENSIL	ELONG.												
CONTROL	451.2	38.28	84.91												
ROOM TEMPERATURE															
	0.5% SOLUTION				5.0% SOLUTION				2.0% SOLUTION				60 DEGREES C		
	MODULUS	TENSIL	ELONG.		MODULUS	TENSIL	ELONG.		MODULUS	TENSIL	ELONG.		MODULUS	TENSIL	ELONG.
750 HRS.	431.9	36.56	106.4		488.7	34.34	97.87		438.2	29.95	60.11		433.1	24.03	38.15
800 HRS.	484.5	32.21	86.07		478.7	31.26	80.83		515.8	21.28	17.68		518.3	17.91	9.504
2372 HRS.	470.8	31.4	85.88		471	29.83	75.82		508.9	16.33	5.148		518.3	14.16	3.638
3212 HRS.	409.04	29.88	78.53		471	28.84	69.81		486.6	14.3	4.18		472.7	9.838	2.816
6000 HRS.	531	27.83	82.71		318.2	28.43	74.06		378.9	12.38	4.875		367.5	3.012	4.151
6324 HRS.	483.8	28.82	66.28		484.1	25.6	46.37		505.3	14.8	4.178		486.2	7.462	1.709
10000 HRS.	491.5	25.63	53.86		474.8	23.74	40.46		488.6	14.94	6.27		501.8	5.482	1.135

10,000 hr.

300 FN929 - Failed 5.0% Oxalic Acid

OXALIC ACID TEST AVGS.

300FN929

	MODULUS	TENSIL	ELONG.												
CONTROL	347.7	23.85	83.55												
	WOOD TEMPERATURE						60 DEGREES C								
	5% SOLUTION			5% SOLUTION			5% SOLUTION			5% SOLUTION					
	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.
100 HRS.	363.7	31.21	94.85	362.3	31.05	86.97	362	24.15	57.28	358	21.42	41.43			
200 HRS.	392.8	30.08	85.89	396.2	31.21	91.70	421.1	19.14	21.89	409.1	16.78	19.88			
272 HRS.	382.8	27.77	78.82	382.2	28.78	74.89	421.1	12.93	8.911	422.8	12.05	6			
3212 HRS.	408.4	29.88	78.83	374.4	25.26	64.21	408.4	18.38	8.555	415.9	10.96	3.103			
8030 hrs	301.8	25.74	90.5	311.9	24.88	86.88	317.6	13.2	6.527	327	0	4.749			
6854 HRS	368.7	28.84	70.41	378.9	23.57	44.47	481.9	13.96	3.988	0	0.208	0.0658			
10000 HRS.	394.8	21.72	48.88	413.1	21.41	40.44	417.1	14.63	7.48	samples failed					

OXALIC ACID TEST AVGS.

500FN131

	ROOM TEMPERATURE			90 DEGREE C								
	MODULUS	TENSIL	ELONG.	5% SOLUTION			10% SOLUTION			50% SOLUTION		
	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.	MODULUS	TENSIL	ELONG.
CONTROL	317.9	25.2	112.9									
100 HRS.	300.9	25.15	115	304.1	25.57	119.8	309.1	18.95	59.78	314.4	17.1	40.71
500 HRS.	327.4	25.78	111.7	330.1	25.8	107.5	341.2	14.83	16.5	345	13.83	13
2372 HRS.	321.7	23.45	99.28	323.8	21.78	82.07	345.8	9.541	4.388	355.1	10.07	4.134
3212 HRS.	314.9	22.17	89.41	314.8	21.51	81.90	330.8	9.577	4.048	341.9	9.073	3.274
8228 HRS.	221.8	18.51	100.1	328.9	18.35	85.49	302.9	0	5.7	284.8	8.533	4.336
8824 HRS.	317.3	22.43	89.57	302.8	18.72	64.05	378.5	9.388	2.588	Failed	Failed	Failed
10000 HRS.	349.4	18.93	59.17	0	0	0	0	0	0	0	0	0

JRW

05/11/88

0.5% Oxalic Acid
 10,000 hr
 Rm. Temp

Sample Identification: 300NN

Test Date: 17 Jan 1980

Out of 5 specimens, 0 excluded.

Sample comments: 300NN 10000HRS 0.5 OXALIC ACID

Rm Temp

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LINS 1.0-3.0)	STRESS @ 3% ELONG	STRESS @ 5% ELONG	STRESS @ 50% ELON	STRESS @ THRESHOLD	LOAD AT
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(F3) (Kpsi)	(F3) (Kpsi)	G (F50) (Kpsi)	YIELD (Kpsi)	MAX. LOAD (Lbs)
1	23.93	41.26	497.4	10.48	12.75	-----	16.24	35.90
2	27.38	66.01	500.0	10.48	12.57	25.03	16.01	41.07
3	26.58	60.38	454.2	10.17	12.54	25.15	19.00	39.83
4	25.59	52.93	514.9	10.45	12.66	25.16	16.91	38.39
5	24.66	47.74	490.1	10.25	12.52	-----	16.21	37.00
Mean:	25.63	53.66	491.5	10.35	12.61	-----	16.07	38.44
Standard Deviation:	1.39	9.84	22.7	.13	.10	-----	1.23	2.09
Minimum:	23.93	41.26	454.2	10.17	12.52	-----	16.01	35.90
Maximum:	27.38	66.01	514.9	10.48	12.75	-----	19.00	41.07
Cof of Var:	5.42	18.33	4.62	1.29	.77	-----	7.31	5.43

5.0% Oxalic Acid

10000 hrs
Rm Temp.

Sample Identification: 300HM

Test Date: 19 Jan 1980

Out of 5 specimens, 0 excluded.

Sample comments: 300HM 5.0% OXALIC ACID 10000 HRS. Room Temp.

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LINE 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELON (F50)	STRESS THRESHOLD YIELD	LOAD AT MAX. LOAD
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	21.71	26.12	497.5	10.400	12.60	-----	16.37	32.57
2	23.10	34.28	481.9	10.360	12.67	-----	16.57	34.66
3	24.36	45.91	410.3	9.933	12.44	-----	18.36	36.54
4	24.00	42.41	460.1	10.300	12.68	-----	18.36	36.00
5	25.52	53.59	515.5	10.590	12.81	25.02	16.24	38.28
Mean:	23.74	40.46	474.6	10.320	12.64	-----	17.18	35.61
Standard Deviation:	1.43	10.60	40.1	.240	.14	-----	1.88	2.14
Minimum:	21.71	26.12	410.3	9.933	12.44	-----	16.24	32.57
Maximum:	25.52	53.59	515.5	10.590	12.81	-----	18.36	38.28
Cof of Var:	6.01	26.20	8.46	2.32	1.07	-----	6.31	6.02

Sample Identification: 300HN-1

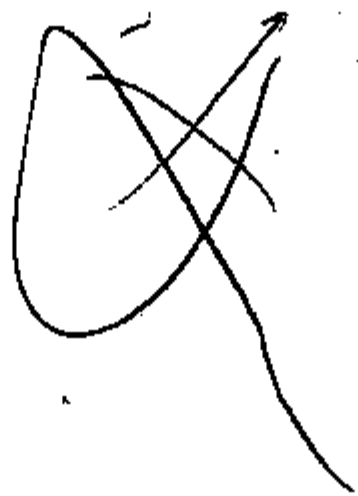
0.5%
90 deg.

Test Date: 15 Jan 1980

Out of 5 specimens, 0 excluded.

Sample comments: 300HN 90 DEG.C 0.5 OXALIC ACID 10000HRS.

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG (F50) (Kpsi)	STRESS THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	15.74	6.864	492.4	10.76	14.0600	-----	15.74	23.61
2	13.68	4.892	475.4	10.54	-.8713	-----	13.68	20.53
3	14.68	6.264	441.8	10.11	13.4100	-----	14.68	22.02
4	15.14	6.569	434.5	10.17	13.6100	-----	15.14	22.71
5	15.47	6.755	498.7	10.70	13.9100	-----	15.44	23.21
Mean:	14.94	6.269	468.6	10.45	14.9800	-----	14.92	22.42
Standard Deviation:	.81	.803	29.1	.30	6.1840	-----	.80	1.21
Minimum:	13.68	4.892	434.5	10.11	-.8713	-----	13.68	20.53
Maximum:	15.74	6.864	498.7	10.76	14.0600	-----	15.74	23.61
Cof of Var:	5.41	12.81	6.22	2.86	56.31	-----	5.30	5.41



Sample Identification: 300HN

Test Date: 19 Jan 1980

5.0%
90°C

Out of 5 specimens, 0 excluded.

Sample comments: 300HN 90DEB. ~~S~~ OXALIC ACID 5.0

Specimen Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LINE 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELONG G (F50) (Kpsi)	STRESS YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	4.210	.9095	529.6	-----	-----	-----	4.210	6.314
2	11.300	2.4080	532.9	1.061	-----	-----	11.300	16.950
3	3.248	.6400	498.7	-----	-----	-----	3.248	4.872
4	4.375	.8893	498.7	-----	-----	-----	4.375	6.563
5	4.276	.9348	457.2	-----	-----	-----	4.110	6.414
Mean:	5.482	1.1360	501.6	-----	-----	-----	5.449	8.224
Standard Deviation:	3.295	.7204	30.8	-----	-----	-----	3.201	4.920
Minimum:	3.248	.6400	457.2	-----	-----	-----	3.248	4.872
Maximum:	11.300	2.4080	532.9	-----	-----	-----	11.300	16.950
Cof of Var:	59.92	63.50	6.15	-----	-----	-----	60.58	59.92

[Handwritten signature]
X

0.5% Oxalic Acid

10,000 hr.

Room Temp

Sample Identification: 306FY29

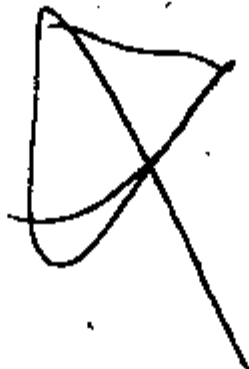
Test Date: 19 Jan 1988

Out of 5 specimens, 0 excluded.

Sample comments: 0.5 OXALIC ACID 10000HRS.

Room Temp

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LINE 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELON (F50)	STRESS @ THRESHOLD YIELD	LOAD AT MAX. LOAD
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	24.70	63.79	394.8	8.382	10.13	22.61	15.68	37.84
2	22.08	46.45	397.7	8.281	10.14	-----	14.78	33.12
3	16.71	16.44	466.6	8.331	10.18	-----	15.48	25.06
4	21.71	45.29	412.0	8.323	10.10	-----	15.18	32.57
5	23.40	55.69	363.8	8.180	10.10	22.49	15.22	35.10
Mean:	21.72	45.53	394.8	8.283	10.13	-----	15.27	32.58
Standard Deviation:	3.04	17.91	18.6	.061	.03	-----	.34	4.56
Minimum:	16.71	16.44	363.8	8.180	10.10	-----	14.78	25.06
Maximum:	24.70	63.79	412.0	8.331	10.18	-----	15.68	37.84
Cof of Var:	13.99	39.34	4.71	.74	.32	-----	2.22	13.99



5.0% OXALIC ACID
10,000 hr
Rm. Temp

300FN929

Sample Identification: 300FN929

Room Temp

Test Date: 19 Jan 1980

Out of 5 specimens, 0 excluded.

Sample comments: 300FN929 5.0% OXALIC ACID 10000HRS.

Specimens Number	STRESS AT MAX. LOAD (Kpsi)	% ELONG. AT MAX. LOAD (%)	MODULUS (USER LIMS 1.0-3.0) (Kpsi)	STRESS @ 3% ELONG (F3) (Kpsi)	STRESS @ 5% ELONG (F5) (Kpsi)	STRESS @ 50% ELON (F50) (Kpsi)	STRESS THRESHOLD YIELD (Kpsi)	LOAD AT MAX. LOAD (lbs)
1	20.32	33.17	415.9	8.572	10.39	-----	15.48	30.40
2	20.70	38.52	402.1	8.382	10.23	-----	15.31	31.17
3	22.11	46.48	413.3	8.418	10.23	-----	14.88	33.16
4	21.84	42.79	413.9	8.495	10.35	-----	15.64	32.76
5	22.01	41.25	428.6	8.533	10.44	-----	15.71	33.01
Mean:	21.41	40.44	413.1	8.480	10.33	-----	15.41	32.12
Standard Deviation:	.81	4.98	6.8	.079	.09	-----	.33	1.21
Minimum:	20.32	33.17	402.1	8.382	10.23	-----	14.88	30.40
Maximum:	22.11	46.48	428.6	8.572	10.44	-----	15.71	33.16
Cof of Var:	3.78	12.31	1.65	.93	.91	-----	2.15	3.78



E.I. DUPONT
 DUPONT ROAD
 CIRCLEVILLE, OH 43113

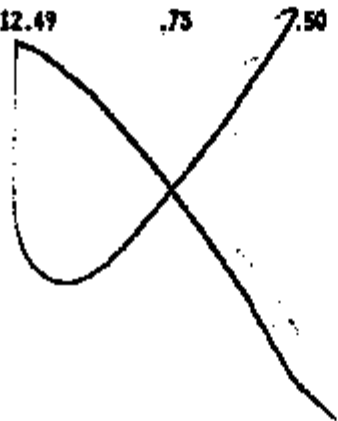
Sample Identification: 300FW929

Test Date: 19 Jan 1980

Out of 4 specimens, 0 excluded.

Sample comments: 300FW929 0.5 OXALIC ACID 10000 MRS. 90 DEG. C

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LIMS 1.0-3.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELON b (F50)	STRESS @ THRESHOLD YIELD	LOAD AT MAX. LOAD
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	13.63	6.192	420.6	9.867	12.60	-----	13.59	20.44
2	15.09	8.348	415.8	9.794	12.56	-----	14.42	22.63
3	14.89	7.930	418.7	9.811	12.63	-----	14.89	22.33
4	14.82	7.441	413.5	9.748	12.56	-----	14.52	21.78
Mean:	14.53	7.478	417.1	9.805	12.59	-----	14.36	21.80
Standard Deviation:	.65	.934	3.1	.049	.03	-----	.55	.97
Minimum:	13.63	6.192	413.5	9.748	12.56	-----	13.59	20.44
Maximum:	15.09	8.348	420.6	9.867	12.63	-----	14.89	22.63
Cof of Var:	4.44	12.49	.75	.50	.28	-----	3.89	4.44



E.I. DUPONT
 DUPONT ROAD
 CIRCLEVILLE, OH 43113

0.5% Oxalic Acid
 10000 hrs.
 Room Temp
 Test Date: 19 Jan 1968

Sample Identification: 500FR131

Out of 3 specimens, 0 excluded.

Sample comments: 0.5 OXALIC ACID 10000HRS.

Room Temp

Specimen Number	STRESS AT	% ELONG. AT	MODULUS (USER LIMS 1.0-9.0)	STRESS @ 3% ELONG (F3)	STRESS @ 5% ELONG (F5)	STRESS @ 50% ELON (F60)	STRESS @ THRESHOLD YIELD	LOAD AT MAX. LOAD
	MAX. LOAD (Kpsi)	MAX. LOAD (%)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(Kpsi)	(lbs)
1	18.61	55.99	346.6	7.253	8.771	17.94	12.61	46.54
2	20.33	72.31	331.3	7.833	8.612	17.90	11.85	50.81
3	17.86	49.22	343.3	7.131	8.670	-----	12.17	44.65
Mean:	18.93	59.17	340.4	7.139	8.684	-----	12.21	47.33
Standard Deviation:	1.26	11.87	8.1	.110	.081	-----	.38	3.16
Minimum:	17.86	49.22	331.3	7.033	8.612	-----	11.85	44.65
Maximum:	20.33	72.31	346.6	7.253	8.771	-----	12.61	50.81
Cof of Var:	6.67	20.06	2.37	1.54	.93	-----	3.11	6.67

X

DuPont Films
Route 23, South DuPont Road
Circleville, OH 43113



DuPont Films

TEST RESULTS

T. I DATA

OXALIC ACID AGING STUDY

Brian Dague @ TI

