CYANAMID

681

Request For Capital Expenditures/Retirements

REPORTING CLASSIFICATION	DATE APPROVED	J.O. OR JOB NO.
A1	9/13/82	PP-5741

PLANT, DIV. OR COMPANY: Polymer Products Division

LOCATION: Chicago Plant

J.O. CONTROL POINT: 097

SHORT TITLE: Install used Werner & Pfleiderer extruder at the Chicago Plant

SUMMARY OF AMOUNTS

DESCRIPTION	LOCAL CURRENCY	U.S. DOLLARS
ESTIMATED PROJECT COST		$78,324
DISMANTLEMENT EXPENSE		0
TRANSFER EQUIPMENT		118,555
GROSS AMOUNT FOR APPROVAL		$196,879
LESS TRANSFER EQUIPMENT		118,555
LESS SALVAGE OR TRADE-IN ALLOWANCE		0
NET CASH REQUIRED (GOF-3027)		$78,324

RETIREMENT DATA

	AMOUNT
COST	104,555
DISMANTLEMENT	0
LESS SALVAGE	0
TOTAL - CHARGE RESERVE	104,555

DESCRIPTION AND REASONS REQUIRED

ECONOMICS as called for in General Procedure Memo #3 Attachment C. (Attach calculations)

ECONOMICS PERIOD	10 years
NET SALES ($/yr.)	k$317
NAT (PROFIT/SAVINGS)	k$51
TOTAL INVESTMENT	k$154
% ROI (on TOTAL INVEST.)	33%
INTERNAL RATE OF RETURN	56%
PAYOUT OF NEW FIXED CAPITAL	2.4 years

REVISION DETAIL (GROSS AMOUNTS)

REV.#	DATE	AMOUNT	CUM. AUTHORIZATION
1			
2			
3			
4			
5			
6			
7			

Funds of - $78,324 are requested to install a used Werner & Pfleiderer extruder at the Chicago Plant for the purpose of manufacturing extruded lead based heat stabilizers.

SEP 20 1982

SUMMARY OF ESTIMATED COST - Details on GOF-3027

ESTIMATE NO.

STARTING DATE: 1 week after approval

COMPLETION DATE

ITEM NO.	DESCRIPTION	MATERIAL	LABOR	ENGINEERING	TOTAL
	See attached sheet				
	NET CASH REQUIRED	46,997	30,827	500	78,324

ACCOUNTING TREATMENT

ITEM NO.		DEPR. RATE
	Debit $59,515 to PP&E 2A320	7 1/4%
	Debit 18,809 expense as incurred	
	Credit 104,555 to PP&E 61-320	
	Debit 104,555 reserve for deprec. 61-320	
	Debit 14,000 PP&E 3T 320	7 1/4%

ACCOUNTING TREATMENT ESCALATED ☐ APPROVED BY DIV. CONTROLLER (CHECK BOX) ☐ DATE 9/9/82

POST AUDIT PERIOD

POST AUDIT DUE DATE

APPROVALS

NAME	DATE
PROJECT SPONSOR	
R A Reeder	9/7/82
J Clapoun	9/9/82
DIVISION PRESIDENT/GENERAL MANAGER	9-13-82

PROPOSED WORK AND COST

Capital in the amount of $78,324 cash is requested for the transferring from Bound Brook and installation at Chicago of an idle Werner & Pfleiderer twin-screw extruder to provide for the production of waxed-lead heat stabilizers. The gross amount requested for approval also includes an additional $118,555 of transferred equipment which will be written down to its fair market value of $14,000.

PRESENT SITUATION AND REASON FOR REQUEST

Cyanamid's current line of lead stabilizers consists of lead salts which are sold as thermal stabilizers primarily for PVC wire and cable applications. They are supplied in the form of a fine white powder, packed in 50 lb paper or plastic bags, or 2,000 lb semi-bulk containers.

With the advent of the OSHA lead standard in March 1979, all producers and users of lead or lead compounds were obligated to improve their programs for protecting their employees from ingesting or breathing lead dust by administrative and/or engineering controls.

The industry has responded by accelerating the development of various de-dusted products and improved stabilizer packaging and handling equipment. All have deficiencies:

a. Oiled (plasticized) lead salts are not sufficiently dust-free to allow user compliance of OSHA lead-in-air standards ($50 \mu g/m^3$).

b. TEFLON polytetrafluoroethylene treated stabilizers are superior to oiled types but are more costly, not totally dust-free, and contribute to dispersion problems in processing.

c. Air pallet semi-bulk containers, which allow the unloading and transfer of conventional lead stabilizers through a totally closed system, can be an effective method of meeting OSHA standards if properly installed. However, capital equipment requirements for stabilizer customers are substantial (k$50-300).

In order to fulfill this unsatisfied need, Monson Chemical, Inc. under license by Hondorf Chemical, Netherlands began manufacturing encapulated waxed lead stabilizers in 1980. They have been successful in obtaining 500-700 k lb volume from Cerro Wire and Cable, previously supplied by Cyanamid, plus an additional 200-300 k lbs volume at other accounts formerly supplied by Associated Lead. Cerro reported lead-in-air improvement from 60-100 $\mu g/m^3$ to 5-10 $\mu g/m^3$. In response, Cyanamid has undergone its own waxed lead stabilizer development program. Approximately 20 k lb of sulfate, carbonate and phthalate wax mix extrudates have been prepared in the Bound Brook pilot plant. They were prepared under the supervision of the Plastic Additives Technical Service Group, utilizing an existing Werner & Pfleiderer extruder, formerly used to produce polyurethanes. The resultant lead stabilizer extrudates have performed well in in-house testing and in plant trials at Cerro. Pending final Cerro approval expected in late August, we can expect to re-establish Cyanamid at a 50% supply position.

In order to 1) regain a major share of Cerro's lead stabilizer volume, 2) offer the industry an alternative to capital intensive semi bulk handling to control lead in air and 3) prevent further erosion of Cyanamid share to Monson, it is recommended that Cyanamid introduce its own waxed lead stabilizers.

Recognizing the uncertain condition of Cyanamid's lead stabilizer business, this investment is nevertheless recommended because in the event of a sale of the business to a non-lead stabilizer producer, the ability to manufacture the extrudate would further enhance the value of the business. This could be true from the point-of-view of both an increased PP&E base as well as a stronger commercial position. Also, any downside due to loss of this investment is minimized by the relatively short 2.4 year payout of the project.

DETAILS OF PROPOSAL

Lead carbonate, lead phthalate, and lead sulfate powdered stabilizers would continue to be manufactured at Chicago in the standard two-step process:

1. Pig lead is milled and oxidized into litharge.

2. Litharge is slurried in water and reacted with carbon dioxide, phthalic anhydride, or sulfuric acid to produce lead salts that are dried, milled and blended.

The stabilizers will then be dry mixed with 10-17% of ester wax, stearic acid, and lead stearate in the existing Chicago plant blending system. The wax-stabilizer mix will then be processed through the Werner & Pfleiderer extruder.

The Werner Pfleiderer twin-screw extruder model ZSK53 located in the pilot plant building at the Bound Brook plant will be transferred to the Chicago plant and installed in an existing open area in Bldg. 24, adjacent to the blending unit. Sufficient additional open area would remain should sales eventually warrant another extrusion unit.

Existing power, water, and ventilation systems located close to the extruder site, will allow for relatively easy hookup.

PRODUCTION FACTORS

Feed rates of 530 lb/hr for CYASTAB® SW (sulfate) and 450 lb/hr for CYASTAB CW (carbonate) have been demonstrated; indicating a three-shift capacity of 3.0 M lb/yr. Current sales projections suggest this to be more than adequate through 1987.

CONTINGENT FUTURE COMMITMENTS

This proposal will not require additional funds to complete.

COMMERCIAL FACTORS

While Monson Chemical is the first domestic supplier to offer waxed lead stabilizers, they are not basic in the powdered lead stabilizers which they must import from Hondorf or source from domestic producers such as Cyanamid, Hammond, Associated Lead. Monson has experienced some initial product deficiencies related to heat stability and melt temperature. Cerro appears to be the only major account that they have successfully penetrated, although Monson is supplying 2-3 smaller customers and aggressively pursuing larger users. Cerro is paying approximately 20% premium over conventional lead stabilizers. Elimination of material losses through dusting and performance equivalency to conventional stabilizers at lower concentration levels can offset all or part of this differential.

Cyanamid's development work indicates that CYASTAB waxed lead stabilizer products generally display superior thermal stability and equivalent or improved physical and electrical properties relative to Monson Chemical's products. (See Appendix VI.) Associated Lead, Hammond Lead and Syn-Pro (Dart) are thought to be conducting similar development work. It is believed that Cyanamid is closer to commercialization than any competitor, save Monson.

Appendix IV gives domestic waxed lead stabilizer sales forecast for two scenarios. The Base Case reflects Cyanamid's ability to regain 50% of Cerro's business (see supporting letter, Appendix IV). The Upside Potential case assumes Cyanamid is successful in (1) obtaining 70-75% of Cerro's business, (2) gaining 50% of Hoechst 200 k lb requirement for use in PVC credit cards, and (3) gaining market share against powdered stabilizer suppliers for rigid PVC and wire and cable applications. Hoechst is concerned with lead-in-air levels and is evaluating air pallet systems and encapulated waxed lead stabilizers. Their tests to date show the oven stability of CYASTAB CW to be superior to both their current formulation and Hondorf Chemicals' waxed product. In addition to Hoechst, Cyanamid samples have been submitted to Ethyl Corp., Abcom, and Carlon who have a combined potential of 1.5-2.0 M lbs. Although preliminary testing is encouraging, it is too early to project firm sales to these accounts.

FINANCIAL RETURN

The net cash required is $78,324 of which $59,515 is capitalized and $18,809 is expensed. The gross amount requested for approval also includes an additional $118,555 of transferred equipment which will be written down to its fair market value of $14,000 (see attachment VIII). Start-up costs are estimated to be $20,000.

Installation of the extruder in Chicago by September, 1982 will enable cash returns to begin by October, 1982. Assuming that sales are restricted to 50% share of Cerro's volume (Base Case condition), the constant dollar payout on new fixed capital is 2.4 years and the ten year IRR is 56%. The ten year average return on investment is 33%. Variable cost estimates assume $.30/lb lead cost (current price is $0.26-0.27/lb). Manufacturing costs were considered on a differential basis while expenses were based on full 1982 budgeted lead stabilizer expense ratios. As it is not anticipated that additional sales or technical staffing will be needed, this assumption is conservative. Realization of the Upside Case would result in a 2.0 year payout, an 83% IRR, and a 48% return on investment.

ALTERNATIVES CONSIDERED

Batch Process - Premix stabilizer and wax in a Ross mixer and feed to a Sterling single-screw extruder. Tests at Ross and Sterling showed this could be done, but with very limited production and higher labor costs. In-house plant trials proved that the Chicago plant's blending system could mix the stabilizer and powdered wax, thus the Ross equipment was not needed. The W & P extruder did a better job than did the Sterling, with higher output. Book value of in-house extruder is much lower than the cost of a new Sterling.

RISKS

1. Cerro Wire And Cable Does Not Buy

   Historically, Cyanamid has had an excellent sales relationship with Cerro. Until Monson Chemical provided the answer to their dusting concerns, Cyanamid had enjoyed 75-90% of their 600 k lb business. Cerro has run plant trials successfully with 2 k lb each of CYASTAB CW and SW. CYASTAB has a lower melt temperature relative to Hondostab's which enhances its processibility. Cerro is currently running another 5 k lb each of CW and SW and full approval is expected by the end of August. We have received prior verbal commitments from Cerro to establish Cyanamid at 50% supply position for the second half of 1982, pending final product approval. (See Attachment IVb.)

2. Hondostab Reduces Price To Retain Business

   The base case economic returns assume that Cyanamid would obtain Cerro volume at 5-6% below Monson Chemicals' current price. This is considered reasonable as Cyanamid would be selling at 48% marginal income, approximately at the same level of its very mature powdered lead stabilizer business. Furthermore, Monson Chemical must import the powdered stabilizer and would still be at a disadvantage should they begin buying it domestically. If the market price were to erode an additional 13%, the marginal income ratio would be 40%, the payout on new fixed capital would be 3.3 years, and the IRR 32%.

SUMMARY

Capital in the amount of $78,324 cash is requested for the tranferring from Bound Brook and installation at Chicago of an idle Werner & Pfleiderer twin-screw extruder to provide for the production of waxed-lead heat stabilizers.

ST/1869-O/010-O

ATTACHMENTS

I. Fixed Capital Estimates - Details

II. Waxed Stabilizer Costs

III. Competitive Pricing

IV. Sales Forecast

- a. Volume Estimates
- b. Supporting Letter - Cerro

V. Financial Analysis

- a. Estimated Operating Results - Base Case
- b. Differential Cash Flows - Base Case
- c. Estimated Operating Results - Upside Potential
- d. Differential Cash Flow - Upside Potential
- e. Effect of Variations in Volume, Fixed Capital and Selling Price

VI. Pilot Plant Production

VII. Technical Bulletin

VIII. Transfer Value

GOF- 8027 REV. 7/62 PRINTED IN U.S.A. 7/62

DETAIL SHEET

SHEET NO. | JOB ORDER NO. | DATE July 2, 1982

COMPANY: American Cyanamid Company | LOCATION: Chicago Plant

ITEM OR CODE NO.	DESCRIPTION	EQUIPMENT OR MATERIALS	LABOR	ENG. MECH. SVC.	TOTAL
(27-33) 05741 (32-33) 7000					
1	Reassemble conveyor	1500	2000		3500*
2	Pipe installation	1322	2643		3965
3	Manifold repair	417	833		1250
4	Electric installation	12674	16176		28850
5	Dust collector & unloading platform	1500	3000		4500
6	Extruder and belt installation		4575		4575
7	Crating and shipping	12000			12000*
8	Air pallet unloading system	10812		(4449) →	10812
9	Freight	1500			1500
				500	500
10	Taxes	1309			1309*
11	Escalation 5%	3563			3563
12	W&P electrician-repair and set-up	400	1600		2000*
		46997	30827	500	78324
14	NOT IDENTIFIED				
15					
16					

	Acquisition Date	Value
Transfer value	1/75	118,555
Fair market value (see Attachment VIII)		14,000
		104,555

* Expensed

CYANAMID

Memorandum

To: G. Ruhf

Location: Wayne

From: H. C. Gaffney

Location: Chicago Plant

Extension:

Subject: Waxed Stabilizer Costs

Date: June 16, 1982

Reference:

Copy to: J. Daly - BB
R. Johnson - MG
J. Stretanski - BB
B. Witherspoon - CN

Supplementing my letter of June 4th, here is additional data for the estimated cost for manufacturing extruded stabilizer.

	Variable Cost *	Period Cost	Total Cost	Lead Content
CW	.5731	.1057	.6788	63%
SW	.5381	.1161	.6542	73%
TW	.6412	.1598	.8010	62%

* based on $0.45/lb lead cost

Job order economics based on $0.30/lb lead
New variable costs: CW 0.479, SW 0.429, TW 0.548 ($/lb)

HCG:ck

H. C. Gaffney

N14630.02

CYANAMID

Memorandum

To: G. Ruhf

Location: Wayne

From: H. C. Gaffney

Location: Chicago Plant

Extension:

Subject: Waxed Stabilizers - Costs

Date: June 4, 1982

Reference:

RECEIVED
JUN 7 1982
C. M. RUHF

Copy to: J. Daly - NA
R. Johnson - MG
J. Stretanski - BB
B. Witherspoon - CN

Cost for manufacturing the waxed stabilizers is:

CW	-	.6788
SW	-	.6547
TW	-	.8010

Assumptions

A. 12,000 pounds/day thru-put.
B. Container cost of .0350/lb. - 100 pounds net.
C. $75,000 installation cost.
D. 45¢ lead cost. [1]
E. One man/shift to operate the extrusion process.

This has been reviewed with but not audited by Ben Witherspoon, our accountant.

H. C. Gaffney

HCG:ck

[1] Note: Job order economics based on current lead costs ($0.30/lb)

N14630.03

NA 839 REV 7-77 7-77

CYANAMID

To: File

Date: April 1, 1982

Location: Bound Brook

Copy to:
R. P. Halpin BB
P. J. Kondla BB
G. A. Menghi HO
F. E. Rudolph AZ
G. M. Ruhf NA
M. L. Siano BB
J. A. Stretanski BB

From: J. A. Zebrowski

Location: Bound Brook

Subject: MONSON CHEMICALS, INC. - ENVIROSTRAND® LEOMINSTER, MASSACHUSETTS

Reference: Pricing

RECEIVED
APR 5 1982
G. M. RUHF

The following updated truckload pricing schedule for EnviroStrand's waxed lead stabilizer extrudates was obtained from Cerro Wire and Cable:

Product	Price Per Pound
EnviroStab 1092 (Tribasic Lead Sulfate)	$0.90
EnviroStab 1093 (Basic Lead Carbonate)	1.03
EnviroStab 1155 (Dibasic Lead Phthalate)	1.23

J. A. Zebrowski

JAZ:dk

ATTACHMENT IVa

WAXED LEAD STABILIZER
SALES FORECAST

BASE CASE

	1982		1983		1984		1985		1986		1987	
Cerro Wire	k Lbs.	k$	k Lbs.	k$	k Lbs.	k$	k Lbs.	k$	k Lbs.	k$	k Lbs.	k$
CYASTAB CW ($.85/1b.)	35	30	150	128	175	149	180	153	185	157	190	162
CYASTAB SW ($.98/1b.)	35	34	150	147	175	172	180	176	185	181	190	186
Total	70	64	300	275	350	321	360	329	370	338	380	348

UPSIDE POTENTIAL

	1982		1983		1984		1985		1986		1987	
Cerro Wire	k Lbs.	k$	k lbs.	k$	k Lbs.	k$	k Lbs.	k$	k Lbs.	k$	k Lbs.	k$
CYASTAB CW ($.80/1b.)	35	28	225	180	250	200	257	206	265	211	272	218
CYASTAB SW ($.93/1b.)	35	33	225	209	250	232	258	240	265	247	273	262
Hoechst												
CYASTAB CW ($.85/1b.)	10	8	100	85	110	94	120	102	130	111	140	119
Other												
CYSTAB SW ($.98/1b.)	-	-	50	49	100	98	150	147	200	196	250	245
Total	80	69	600	523	710	624	785	695	860	765	935	844

Assumptions:
- Lead cost @ $.30/1b.
- Cyanamid obtains 50% Cerro share at $.05/1b. below current Monson Chemical price in BASE CASE.
- Cyanamid obtains 70-75% Cerro share at $.10/1b. below current Monson Chemical price in UPSIDE CASE.

FBM
7/29/82

CYANAMID

To: F. B. May

Date: July 27, 1982

Location: Bound Brook

Copy to: G. M. Ruhf NA

From: J. A. Zebrowski

Location: Bound Brook

Subject: LEAD STABILIZER EXTRUDATE PRODUCTION
TRANSFER OF EXTRUDER TO CHICAGO PLANT

Reference: Attached Memos: M. L. Siano, 5/25/82
J. A. Zebrowski - 5/26/82

G. M. Ruhf has requested that I forward to your attention supporting data on Cerro Wire & Cable Company regarding the justification of transferring the extruder currently located at Bound Brook, NJ to our Chicago plant. The extruder will be utilized for the production of our waxed lead stabilizer extrudates.

The attached memos are self-explanatory. The 5k-lb quantities of CYASTAB® CW and CYASTAB SW have been produced at the Bound Brook pilot plant and subsequently shipped to Cerro. Cerro has since scheduled plant evaluations for early August. Successful plant runs will establish our products as an approved supply source.

The lead stabilizer extrudate volume projections at Cerro for the second half of 1982 will be significantly lower than initially projected due to their locating a sizeable quantity of regular grade material on inventory that was not previously listed. This material will be accordingly worked off by the year's end.

J. A. Zebrowski

JAZ:dk
att.

To: G. M. Ruhf

Location: Wayne

From: J. A. Zebrowski

Location: Bound Brook

Subject: Lead Stabilizer Extrudate Production
Chicago Plant

Reference: Cerro Wire & Cable
Maspeth, N.Y.
See attached memo

Date: May 26, 1982

Copy to: R. F. Anderson
J. J. Cardone
J. F. Daly
H. C. Gaffney
R. P. Halpin
G. A. Menghi
F. E. Rudolph
M. L. Siano
J. A. Stretanski
R. B. Toothill

As stated in the attached memo, the lead stabilizer extrudate evaluations continue to produce positive results at Cerro. Following our production, shipment and subsequent plant approval by Cerro of the 5klbs. ordersreceived for Cyastab CW and SW, we will be fully approved as a supply source of these raw materials. As stated, full approval is expected in June provided we can supply material.

As per information received from J. F. Daly, the production of the 5klbs. quantities of CW and SW at our Bound Brook pilot facility will take approximately 3 weeks and will incur a number of support costs. It is, therefore, recommended that we now make arrangements as soon as possible to transfer the extruder from Bound Brook to the Chicago plant prior to scheduling the production of the 5klbs. quantities of Cyastab CW and SW.

The total lead stabilizer extrudate EAC at Cerro (Maspeth, NY; Hartselle, AL) in estimated at 500-700klbs. We have received prior verbal commitments from Cerro to establish AMCY at a 50% supply position for the second half of 1982 subsequent to our obtaining product approval.

Based on our long standing excellent relationship and supply record with this account, I feel confident that we will achieve a 50% supply position for the second half of 1982 with an objective of a 70% minimum supply position in 1983.

J. A. Zebrowski

JAZ:dos
attach.

To: J. A. Zebrowski

Location: Bound Brook

From: M. L. Siano

Location: Bound Brook

Subject: Cerro Wire & Cable (Marmon Group)
Maspeth, NY

Reference:

Date: May 25, 1982

Copy to: R. F. Anderson
J. J. Cardone
J. Daly
H. C. Gaffney
G. A. Menghi
J. A. Stretanski
R. B. Toothill

Mr. Bob Betancourt, Technical Director, advises that the 2k lbs. each of Cyastab CW and SW shipped 5/11/82 have been partially run in Maspeth production. Plant trials to date are satisfactory. The Maspeth plant is shut down this week due to lack of customer orders. When the plant resumes operations June 1, Cyastab CW and SW plant trials will continue until material is used up (estimated completion date June 12).

Today Cerro placed another order for 5k lbs. each Cyastab CW and SW for immediate delivery to continue plant trials. Upon their completion, if everything has run satisfactorily, we will have final approval on Cyastab CW (EAC = 200k lbs.) and Cyastab SW (EAC = 250k lbs.).

The 100 lbs. Cyastab TW shipped 4/6/82 has not yet been run (EAC = 50k lbs.).

M. L. Siano

M. L. Siano

MLS:dos

Encapsulated Waxe Lead Stabilizer Attachment Va

NA 3060.02 4-77 477

ESTIMATED OPERATING RESULTS

($000)

Constant $

BASE CASE

Cerro Only

☐ WITHOUT NEW INVESTMENT
☐ WITH NEW INVESTMENT
☒ DIFFERENTIAL

BUSINESS/PROJECT:

ESTIMATED STARTING DATE OF OPERATIONS 9/82	Cumulative Pre-Plant & Start-Up Costs	YEAR OF OPERATION 1ST 19 82	2ND 19 83	3RD 19 84	4TH 19 85	5TH 19 86	6TH 19 87	7TH 19 88	8TH 19 89	9TH 19 90	10TH 19 91	AVERAGE TEN YEARS
PRODUCTION DATA:												
% of Capacity												
Quantity (Specify Unit)		70	300	350	360	370	380	391	403	415	428	347
Unit Cost ($/Unit)												
DISPOSITION OF PRODUCTION:												
Merchant Sales	$	$ 64	$ 275	$ 320	$ 329	$ 339	$ 348	$ 358	$ 369	$ 380	$ 392	$ 317
Unit Price ($/Unit) (.915)												
Captive Use	$	$	$	$	$	$	$	$	$	$	$	$
Unit Price ($/Unit)												
SALES AND/OR CAPTIVE USE:	$	$ 64	$ 275	$ 320	$ 329	$ 339	$ 348	$ 358	$ 369	$ 380	$ 392	$ 317
Cost of Production (excl depreciation)	38	38	144	167	171	176	180	185	191	196	202	165
Depreciation – New Facilities		5	5	5	5	5	5	5	5	5	5	5
– Existing Facilities												
TOTAL COST OF PRODUCTION		43	149	172	176	181	185	190	196	201	207	170
GROSS PROFIT		21	126	148	153	158	163	168	173	179	185	145
EXPENSES 10-year avg. %												
Commercial 8.6 %												
Administrative 3.3 %												
Research & Development 0.4 %												
Working Capital Charge 1.6 %												
%												
TOTAL EXPENSES 13.9 %		9	38	44	46	47	48	50	51	53	54	45
NET INCOME (before taxes)	(38)	12	88	104	107	111	115	118	122	126	131	102
INCOME TAX (%)	(19)	6	44	52	53	55	57	59	61	63	65	51
NET INCOME (after taxes)	$ (19)	$ 12	$ 44	$ 52	$ 54	$ 56	$ 58	$ 59	$ 61	$ 63	$ 66	$ 51
% OF SALES	%	18.8 %	16.0 %	16.2 %	16.4 %	16.5 %	16.7 %	16.5 %	16.5 %	16.6 %	16.8 %	16.1 %
INVESTMENT												
New PP&E	$	$ 74	$ 74	$ 74	$ 74	$ 74	$ 74	$ 74	$ 74	$ 74	$ 74	$ 74
Working Capital – Accts Receivable		8	34	40	41	42	44	45	46	48	49	40
– Inventories		10	35	41	42	43	44	45	46	47	49	40
– Total		18	69	81	83	85	88	90	92	95	98	80
Existing PP&E – Production												
– Other												
– Total												
TAL INVESTMENT	$	$ 92	$ 143	$ 155	$ 157	$ 159	$ 162	$ 164	$ 166	$ 169	$ 172	$ 154
TURN ON INVESTMENT (ROI%)	%	14.1 %	30.8 %	33.5 %	34.4 %	35.2 %	35.8 %	36.0 %	36.7 %	37.2 %	38.4 %	33 %

(YEAR AVERAGE ROI: 30%

Economics on pages ... to ... reviewed by: ...

-8-

CYWI 25-0007300

N14630.09

PP-5741 8/9/13 Page of

Encapsulated Waxed Lead Stabilizers

BASE CASE

NA 6567 2-75

PROJECTED DIFFERENTIAL CASH FLOWS

($000)

ESTIMATED YEAR OF START-UP 19 82

	Current Year 19 82	Next Year 19 83	2nd Year Year 19 84	3rd Year After 19 85	4th Year After 19 86	5th Year After 19 87	6th Year After 19 88	7th Year After 19 89	8th Year After 19 90	9th Year After 19 91	10th Year After 19	11th Year After 19	12th Year After 19	Years 13-n (Average) n =
Net Before Tax Earnings	(26)	88	104	107	111	115	118	122	126	131				
Add: Costing Depreciation	5	5	5	5	5	5	5	5	5	5				
Subtract: Tax Depreciation	9	13	13	13	13									
NBT Earnings – Tax Basis	(30)	80	96	99	103	120	123	127	131	136				
Subtract: Income Tax–Tax Basis	(15)	40	48	49	51	60	61	63	65	68				
ITC	6													
Net After Tax Earnings–Tax Basis	(9)	40	48	50	52	60	62	64	66	68				
Add: Tax Depreciation	9	13	13	13	13									
Operating Cash Flow–Tax Basis	0	53	61	63	65	60	62	64	66	68				
Fixed Capital Expenditures	60													
Net Change in:														
–Accounts Receivable	8	26	6	1	1	2	1	1	2	1				
–Inventories	10	25	6	1	1	1	1	1	1	2				
–Accounts Payable	5	12	3	–	–	–	–	–	–	1				
Cash Outflow	73	39	9	2	2	3	2	2	3	2				
Add/Subtract: Other Cash Flow														
Net Cash Flow	(73)	14	52	61	63	57	60	62	63	66				

Payback 2.4 years

INTERNAL RATE OF RETURN = 56%

Capital Recovery (Year n)

Fixed Capital:

Working Capital:

Other:

Total

Encapsulated Waxed ad Stabilizer — Attachment Vc

Upside Potential

ESTIMATED OPERATING RESULTS

($000)

☐ WITHOUT NEW INVESTMENT
☐ WITH NEW INVESTMENT
☒ DIFFERENTIAL

BUSINESS/PROJECT: Constant $

ESTIMATED STARTING DATE OF OPERATIONS 9/82

	Cumulative Pre-Plant & Start-Up Costs	YEAR OF OPERATION 1ST 19 82	2ND 19 83	3RD 19 84	4TH 19 85	5TH 19 86	6TH 19 87	7TH 19 88	8TH 19 89	9TH 19 90	10TH 19 91	AVERAGE TEN YEARS
PRODUCTION DATA:												
% of Capacity												
Quantity (Specify Unit)		80	600	710	785	860	935	963	992	1021	1052	800
Unit Cost ($/Unit)												
DISPOSITION OF PRODUCTION:												
Merchant Sales	$	$ 69	$ 523	$ 624	$ 695	$ 765	$ 844	$ 869	$ 895	$ 922	$ 950	$ 716
Unit Price ($/Unit) (.915)												
Captive Use	$	$	$	$	$	$	$	$	$	$	$	$
Unit Price ($/Unit)												
SALES AND/OR CAPTIVE USE:	$	$ 69	$ 523	$ 624	$ 695	$ 765	$ 844	$ 869	$ 895	$ 922	$ 950	$ 716
Cost of Production (excl depreciation)		45	282	330	364	396	429	442	455	468	482	369
Depreciation – New Facilities	38	5	5	5	5	5	5	5	5	5	5	5
– Existing Facilities												
TOTAL COST OF PRODUCTION		50	287	335	369	401	434	447	460	473	487	374
GROSS PROFIT		19	236	289	326	364	410	422	435	449	463	342
EXPENSES 10-year avg. %												
Commercial 8.6 %												
Administrative 3.3 %												
Research & Development 0.4 %												
Working Capital Charge 1.6 %												
%												
TOTAL EXPENSES 13.9 %		10	73	87	97	106	117	121	124	128	132	100
NET INCOME (before taxes)	(38)	9	163	202	226	258	293	301	311	321	331	240
INCOME TAX (%)	(19)	4	81	101	113	129	146	150	155	160	165	120
NET INCOME (after taxes)	$ (19)	$ 12	$ 82	$ 101	$ 113	$ 129	$ 147	$ 151	$ 156	$ 161	$ 166	$ 120
% OF SALES	%	%	%	%	%	%	%	%	%	%	%	16.8 %
INVESTMENT												
New PP&E	$	$ 74	$ 74	$ 74	$ 74	$ 74	$ 74	$ 74	$ 74	$ 74	$ 74	$ 74
Working Capital – Accts Receivable		9	65	78	87	96	106	109	112	115	119	90
– Inventories		12	68	79	87	95	102	105	109	112	115	88
– Total		21	133	157	174	191	208	214	221	227	234	178
Existing PP&E – Production												
– Other												
– Total												
TOTAL INVESTMENT	$	$ 95	$ 207	$ 231	$ 248	$ 265	$ 282	$ 288	$ 295	$ 301	$ 308	$ 252
RETURN ON INVESTMENT (ROI%)	%	12.6 %	39.6 %	43.7 %	45.6 %	48.7 %	52.1 %	52.4 %	52.9 %	53.5 %	53.9 %	48 %

SIX YEAR AVERAGE ROI: 43%

Economics on pages ____ to ____ reviewed by: ____

-8-

CYWI 25-0007302

PP-5731 1/9/13 Page of

Attachment Vd

Encapsulated Waxed Lead Stabilizer

Upside Potential

NA 6567 2-75

PROJECTED DIFFERENTIAL CASH FLOWS

($000)

ESTIMATED YEAR OF START-UP 19 82

	Current Year 19 82	Next Year 19 83	2nd Year 19 84	3rd Year After 19 85	4th Year After 19 86	5th Year After 19 87	6th Year After 19 88	7th Year After 19 89	8th Year After 19 90	9th Year After 19 91	10th Year After 19	11th Year After 19	12th Year After 19	Years 13-n (Average) n =
et Before Tax Earnings	(29)	163	202	226	258	293	301	311	321	331				
Add: Costing Depreciation	5	5	5	5	5	5	5	5	5	5				
Subtract: Tax Depreciation	9	13	13	13	13									
NBT Earnings – Tax Basis	(33)	155	194	218	250	298	306	316	326	336				
Subtract: Income Tax–Tax Basis	(17)	77	97	109	125	149	153	158	163	168				
ITC	6													
et After Tax Earnings–Tax Basis	(10)	78	97	109	125	149	153	158	163	168				
Add: Tax Depreciation	9	13	13	13	13									
perating Cash Flow–Tax Basis	(1)	91	110	122	138	149	153	158	163	168				
xed Capital Expenditures	60													
et Change in:														
–Accounts Receivable	9	56	13	9	9	10	3	3	3	4				
–Inventories	12	56	11	8	8	7	3	4	3	3				
–Accounts Payable	6	30	6	4	4	4	2	2	2	2				
ash Outflow	75	82	18	13	13	13	4	5	4	5				
dd/Subtract: Other Cash Flow.														
Net Cash Flow	(76)	9	92	109	125	136	149	153	159	163				

Payout 2.0 years

INTERNAL RATE OF RETURN - 83%

Capital Recovery (Year n)

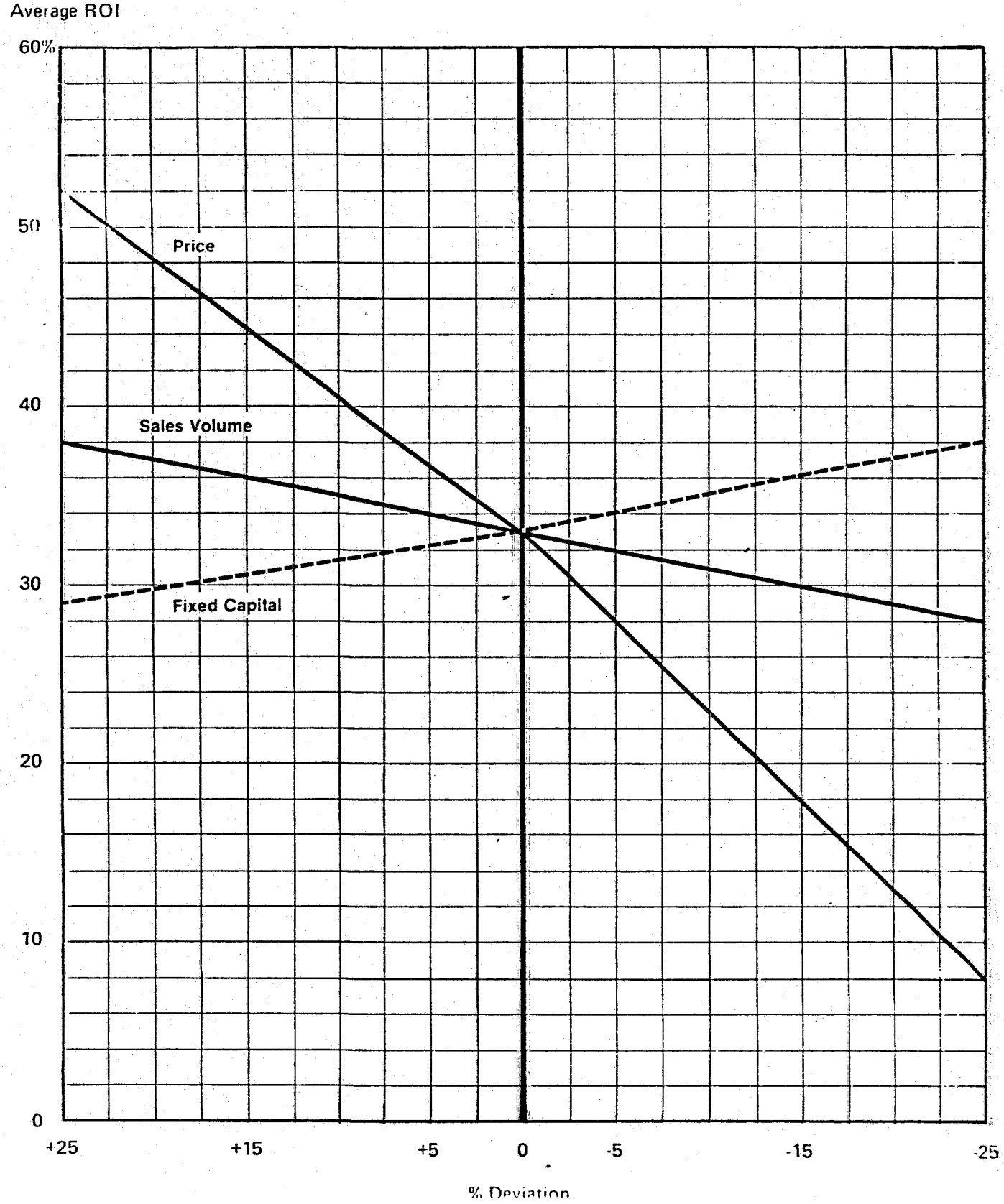
Fixed Capital:

Working Capital:

Other:

Total

EFFECT OF VARIATIONS IN VOLUME, PRICE, AND FIXED CAPITAL ENCAPSULATED WAXED LEAD STABILIZER



CYANAMID

Attachment VI

To: J. A. Stretanski

Location: BB

From: J. F. Daly

Location: BB

Subject: Pilot Plant Production Of CYASTAB® SW and CW

Reference:

Date: July 6, 1982

Copy to: S. A. Brown
H. C. Gaffney
B. Terzic
R. B. Toothill
Job Folder - 1549
Product File

During the week of 6/21/82 CYASTAB SW and CW were produced in the Bound Brook Pilot Plant. A nominal 5000 pounds each were produced.

Both runs on the whole went smoothly, with good rates and excellent product quality. CYASTAB SW ran at about 530 lb/hr and CYASTAB CW at 450 lb/hr. Conditions are listed in the attached Table, along with test results.

During the run of CYASTAB CW, the extruder die plugged three times. This was found to have been caused by pieces of metal lodged in the die. At the end of the run a steel bolt was found in the metering hopper. It had been partially sheared away. The source of the bolt has not yet been determined.

The third plugging resulted in a complete extruder stoppage; and when the head was removed the tip of one of the screws was found to be loose. The threads were stripped. This will have to be repaired by Werner & Pfleiderer before the extruder can be used again.

J. F. Daly

JFD/hg
Attach

TABLE I

	CYASTAB® SW	CYASTAB® CW
Extruder Conditions:		
Zone 1, °F	140	140
Zone 2, °F	170	170
Zone 3, °F	130	130
Zone 4, °F	110	110
Zone 5, °F	100	100
Die, °F	210	210
Feeder, Set	4.3	4.1
Screw, rpm	235	260
Belt, rpm	Max.	Max.
Pressure, psi	35	35
Output, lb/hr	530	450
Torque, %	42	41
Brabender Stability, Minutes		
Extrudate	49.5	57.5
Powder	38.5	44.0

JFD/hg

PLASTICS ADDITIVES

CYANAMID ADDITIVES

TECHNICAL BULLETIN

Attachment VII

ENCAPSULATED

CYASTAB® HEAT STABILIZERS

FOR

POLYVINYL CHLORIDE

CYANAMID

AMERICAN CYANAMID COMPANY

N14630.12

IMPORTANT NOTICE

The information and statements herein are believed to be reliable but are not to be construed as a warranty or representation for which we assume legal responsibility. Users should undertake sufficient verification and testing to determine the suitability for their own particular purpose of any information or products referred to herein. NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE IS MADE.

Nothing herein is to be taken as permission, inducement or recommendation to practice any patented invention without a license.

Printed in U.S. A.

INTRODUCTION

American Cyanamid has developed encapsulated grades of basic lead carbonate (CYASTAB® CW), tribasic lead sulfate (CYASTAB® SW), and dibasic lead phthalate (CYASTAB® TW) to provide a more effective solution to the airborne lead dust problem. CYASTAB CW, SW, and TW are CYASTAB Powder Heat Stabilizers dispersed and encapsulated in a proprietary wax binder system, which are supplied in short strands or pellets. These encapsulated products are easily dispersed into PVC compounds in all types of blending equipment because of the low melting point (60°C, 140°F) of the binder system. These encapsulated products not only solve the lead dust problem, but offer better cost performance through lower specific gravity, lower lubricant requirements, and lower concentration levels to achieve equivalent or superior thermal stabilization of the PVC compound.

ENCAPSULATED PRODUCT LINE

NAME:	CYASTAB® CW	CYASTAB® SW	CYASTAB® TW
TYPE:	CARBONATE	SULFATE	PHTHALATE
CHEMICAL COMPOSITION:	CYASTAB® 40 85%	CYASTAB® 800 90%	CYASTAB® 908 83%

PROPERTIES:

APPEARANCE:	White to Off-White Strand, Approximately 2-3 mm In Diameter		
Binder Melting Point:	60°C (140°F)		
Specific Gravity:	3,5 ± 0,25	3,7 ± 0,25	2,8 ± 0,25
% PbO:	74,4 ± 2,5	80,1 ± 2,5	66,4 ± 2,5

CYANAMID

SERVING THE PVC INDUSTRY

RECOMMENDATIONS:

1. Lubricant levels should be reduced to provide the desired processing properties.

2. Encapsulated CYASTAB Heat Stabilizer levels can frequently be reduced 10-20% without significant effect in thermal stabilizing activity.

APPLICATIONS:

CYASTAB® CW, SW, AND TW products were incorporated into 60°C, 75°C, and 90°C PVC Wire Insulation Compounds, as described on Tables I, II and III. The encapsulated products were compared to their powder heat stabilizer counterparts and to a competitive encapsulated product of the same type. The heat stabilizers were evaluated for; I) Thermal Stabilizing Activity, II) Retention of Physical Properties During Oven Aging, and III) Effect on Electrial Properties.

Performance properties in 60°C PVC Wire Insulation Compound (Table I) show that encapsulated CYASTAB CW provides nearly the same performance as the powdered CYASTAB 40 product at a 20% reduction in concentration level. Also, CYASTAB CW was found to be superior to the competitive encapsulated carbonate product at equivalent concentration levels of 3 and 4 phr.

Performance properties in the 75°C Compound (Table II) show only minor differences between the encapsulated CYASTAB SW product, the powder CYASTAB 800 product, and the competitive encapsulated sulfate product.

Performance properties in the 90°C Compound (Table III) show that the encapsulated CYASTAB TW product provides superior performance to the powdered CYASTAB 908 product at a 40% reduction in concentration level. Also, CYASTAB TW was found to be muchsuperior to the competitive encapsulated phthalate product.

In summary, encapsulated CYASTAB CW, SW and TW products offer on effective solution to the lead dust problem and provide equivalent or superior performance properties to their powder and competitive encapsulated counterparts.

TABLE I

CYASTAB® CW PROPERTIES IN 60°C PVC WIRE INSULATION COMPOUND[1)]

Heat Stabilizer	CYASTAB® 40	CYASTAB ® CW		COMPETITIVE ENCAPSULA CARBONATE PRODUCT	
phr	5	3	4	3	4
Thermal Stabilizing Activity					
Brabender Stability[2)] (Minutes)	72	52.5	65.5	46.5	63
190°C Oven Aging Stability (Minutes)	30	30	30	30	30
I. Retention of Physical Properties					
Tensile Strength (psi)					
Initial	2531	2544	2571	2513	2504
Oven Aged 168 hrs At 100°C	2449	2299	2508	2312	2440
% Retention	97	90	98	92	97
% Elongation					
Initial	268	253	271	284	252
Oven Aged 168 hrs At 100°C	189	190	249	234	200
% Retention	70	75	92	82	79
II. Electrical Properties					
Volume Resistivity (OHM-CM X 10^{12}) RT[3] -	9.0	11.4	9.1	13.1	13
50°C -	0.19	0.24	0.20	0.28	0

1) PVC Resin - 100 phr, DOP-43 phr, Calcium Carbonate - 40 phr, Stearic Acid - 0.25 phr.
2) At 205°C, 100 rpm, No. 5 Roller Blades

TABLE II

CYASTAB® SW PROPERTIES IN 75°C PVC WIRE INSULATION COMPOUND[1)]

Heat Stabilizer	CYASTAB® 800	CYASTAB ® SW		COMPETITIVE ENCAPSULA SULFATE PRODUCT	
phr	5	3	4	3	4
Thermal Stabilizing Activity					
Brabender Stability[2)] (Minutes)	55.5	34.5	48.0	34.5	45
190°C Oven Aging Stability (Minutes)	30	30	30	30	30
Retention of Physical Properties					
Tensile Strength (psi)					
Initial	2578	2550	2531	2423	2419
Oven Aged 168 hrs At 121°C	2589	2552	2732	2613	2473
% Retention	100	100	108	108	102
% Elongation					
Initial	239	275	207	230	233
Oven Aged 168 hrs At 121°C	237	244	203	205	211
% Retention	99	89	98	89	90
Electrical Properties					
Volume Resistivity (OHM-CM X 10^{14}) RT[3] -	27.1	19.3	15.8	10.6	10.
50°C -	4.1	3.1	1.7	1.0	0.

/C Resin - 100 phr, DTDP - 20 phr, DIDP - 30 phr, Clay - 15 phr, Calcium Carbonate - 10 phr
basic Lead Stearate - 0.25 phr.

t 205°C, 100 rpm, No. 5 Roller Blades.

TABLE III

CYASTAB® TW PROPERTIES IN 90°C PVC WIRE INSULATION COMPOUND[1)]

Heat Stabilizer	CYASTAB® 908	CYASTAB® TW		COMPETITIVE ENCAPSULA PHTHALATE PRODUCT	
phr	5	3	4	3	4
Thermal Stabilizing Activity					
Brabender Stability[2)] (Minutes)	31.5	38.0	49.0	34.5	46
190°C Oven Aging Stability (Minutes)	45	>60	>60	45	45
Retention of Physical Properties					
Tensile Strength (psi)					
Initial	2828	2833	2894	2903	2794
Oven Aged 168 hrs At 121°C	2870	2836	2895	3122	2824
% Retention	101	100	100	108	101
% Elongation					
Initial	254	290	277	273	268
Oven Aged 168 hrs At 121°C	267	281	268	278	289
% Retention	105	97	97	102	108
Electrical Properties					
Volume Resistivity ($OHM-CM \times 10^{14}$)	RT[3] - 20.4	20.1	21.2	15.8	13
	50°C - 1.3	0.8	0.8	0.5	0.

on 30 - 100 phr, TOTM - 45 phr, Clay - 7 phr, Antimony Oxide - 1.5 phr, Stearic Acid - 0.2p
205°C, 100 rpm, No. 5 Roller Blades.
om Temperature.

HEALTH CONSIDERATIONS:

The encapsulated CYASTAB products provide a significant reduction in airborne lead dust levels. Nevertheless, it is recommended that direct-contact employees handle these products with the same ventilation, inhalation and hygiene practices that are employed with the powdered CYASTAB products. Use of these standard handling procedures along with encapsulated CYASTAB Heat Stabilizers will markedly improve the safely and healthfullness of the working environment. Recommended practices are described more fully in the Cyanamid bulletin entitled "Safe Handling Practices for Lead Heat Stabilizers.