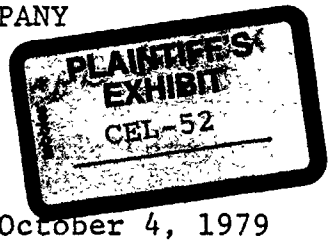
CELANESE PLASTICS & SPECIALTIES COMPANY
Chemcel Plant
Bishop, Texas



TO: E. Munoz

FROM: R. L. Bunkley RLB-54-79 October 4, 1979

Quality Control Monthly Report
September, 1979

Dr. R. A. Daniel - Chatham
Mr. J. W. Beltz
Mr. A. R. Kurkowski
Mr. R. W. Murphy
Mr. F. M. O'Neill
Dr. M. L. Druin (6) - Summit
Mr. C. Gottfried

Mr. A. C. Abshier - Bishop
Mr. W. S. Allen
Mr. C. A. Amond
Mr. G. Artripe
Dr. H. L. Davis
Mr. J. C. Doedyns
Mr. D. L. Dotson
Mr. R. D. Fuchs
Mr. C. L. Hammond
Ms. A. R. Hancock
Mr. L. N. Harvey
Mr. H. P. Hohon
Mr. J. L. Merian
Mr. W. H. Meyer

Dr. M. Meisters
Mr. F. B. McAndrew
Mr. W. L. Shearer
Mr. M. M. Wilson
Mr. D. Zimmerman
Summit Data Files
T. J. Welsh - Chatham

Mr. A. B. Milam
Ms. P. J. Moede
Mr. R. G. Rothenberg
Mr. J. D. Saladino
Mr. A. G. Salinas
Mr. P. N. Thomas
Mr. D. Wallen
Mr. E. D. Wendler
Mr. K. A. Wolf
File: 3.017
301.014
501.009
Central Files (3) - CCCTC

GENERAL SUMMARY:

Product waivers for Celcon® production lots totalled 30.4% of the month's production of 7.02MM lbs. The major out of specification quality parameter for Natural Finishing was melt index with pellet quality and natural color accounting for the second major product variances. Special Products experienced out of specification Kd and poor pellet quality as the major causes of product waivers.

Celanex® quality waivers were required for only 3% of the month's production total of 1.7MM lbs. These quality waivers resulted from out of specification ash content and flammability test failures on the filled products.

Nylon waivers accounted for 31.6% of the month's production total of 1.5MM lbs. The major causes of quality variances continue to be out of specification volatiles and RV.

I. CELCON®:

A. Customer Complaints - Dotson/Tijerina/Hernandez

1. Polymer Corporation entered a precautionary complaint (P-5558) citing underweight bags of C-245 from lot 9032691. The bags were labeled 55 lbs. but contained only 5 lbs. each. The complaint was found to be valid, as the bags were incorrectly labeled. Distribution was requested to isolate and correct the labels on any future shipments of this lot of material. The appropriate personnel have also been made aware of this complaint and instructed on proper packaging weights. (DLD-198-97)

2. A precautionary complaint (P-5525) was entered by Sterling Plastics on a lot (9042171) of Celcon GC-25A black. The customer experienced a white deposit on his molded parts and mold when using this material. Samples of the parts and resin were sent to Summit for evaluation.

   Plant records indicated the lot of material to be specification product. Summit reported the white deposits on the parts to be exposed glass fibers at the part surface. RTS recommended that the customer's molding temperatures be increased to minimize the problem. (DLD-197-79)

3. Injecto Mold entered complaint P-5568 stating they experienced severe gassing and part surface splay when using the gray Celcon color concentrate M90-07 CC 3063 K20 from lot 9051411. The concentrate met all specifications upon release and did not cause molding problems when let down at the proper 1:20 ratio with M90-04. The problem was referred to RTS for further evaluation to determine if an improper (Delrin) resin was used for let down or if abnormal processing conditions were being used. (DLD-211-79)

4. A complaint (P-5572) was entered by McCourtney Plastics Company indicating low physical properties on parts made from Celcon GC-25A natural from lots 9030211, 9052914 and 9053014. Samples of each of the lots were returned to the plant for testing.

   Plant records showed the lots to all be specification materials. Analysis of the return samples confirmed the original analytical results. RTS was requested to visit the customer and determine his specific physical property requirements to allow resolution of this complaint. (DLD-207-79)

At month's end, four Celcon complaints are pending resolution.

B. Manufacturing Support

1. SH-2 Product Color - Moede

   High "b" color values in SH-2 product from the end of August through mid-September initiated an investigation into the possible causes. The following potential problem areas were investigated and eliminated as the cause of the color problem: (1) raw materials, (2) process parameters, (3) nitrogen quality, (4) excess TEA, (5) iron contamination and (6) aldol condensation products. It was discovered that rubber contamination in the quench tank from a deteriorating boot was responsible for the color. Replacement of the boot resulted in a return to normal color values.

2. Evaluation of T-302 Stripping - Moede

   A trial to evaluate stripping trioxane out of the T-302 reactor column was completed September 26th. Reduction of latent heat on the stripping section of the tower resulted in little increase in the trioxane concentration in the residue returned to the reactor and indicated that the stripping section was not operating efficiently. It has been proposed that the trays be repaired so that stripping may be evaluated under efficient operating conditions.

3. Solids in T-305 - Moede

   The T-305 finishing column was washed on September 20th due to solids build-up in the column after only three months of operation. A T-305 residue sample taken on the 17th contained about 20% solids by volume. Although an increase in residue draw-off reduced the solids (caustic salts) in the base of the tower, operational

difficulties continued. The problem of caustic entrainment is believed to be primarily due to the difficulty in controlling caustic in the V-2003 caustic decanter. Improved control by the application of an on-line titrimeter is under consideration.

C. Status of Fiberglass Evaluations (All Products) - Dotson

1. Amarillo Produced OCF Fiberglass Evaluation Trials

Shipments of OCF Amarillo produced fiberglass are currently under evaluation for qualification of this new facility. The status of these evaluations is as follows:

a. Celanex grade fiberglass, 419 N 911, 3/16 inch has been evaluated in Celanex 3310 EF 3022. Evaluation of this material showed it to meet all product specifications and physical properties. This grade of glass has been qualified for use in Celanex glass filled products. (DLD-194-79)

b. Nylon grade fiberglass, 416 CB, 3/16 inch is in the plant and will be evaluated as soon as scheduling permits. (DLD-192-79)

2. Anderson Produced 419 BB 1/8 inch Evaluation

As reported last month, this glass was re-evaluated for use in Celanex products as it had not been used in production since its original qualification in 1977. The glass was used to produce a lot of Celanex 3300 EF-2001. Although all product release specifications were met, tensile strength was judged to be somewhat low compared to normal production. Therefore, additional trials are planned with this glass before requalification.

3. Nittobo Fiberglass

Evaluation of the special Nittobo glasses is still pending arrival of the first shipments. Present shipment status for the Nittobo glasses is as follows:

a. 28M lbs. of the Celcon grade glass; CS-6PE231P, shipped from Japan on 9-21-79 with expected delivery by early November.

b. 28M lbs. of the Nylon grade glass; CS-3J431 was shipped on 9-20-79 with the same expected delivery time.

c. In addition to the above, Nittobo has indicated that their 1/8 inch CS3PE-231N grade may be acceptable for use in our Celanex resins. The suitability of this material is under investigation.

4. Certain Teed Fiberglass

A shipment (10M lbs) of Certain Teed's 3/16 inch, XA4030A001 grade fiberglass has been ordered in preparation for plant evaluation in Celanex glass filled products.

D. Routine Analytical - Salinas

Sample count, overtime hours, holiday overtime hours, and formaldehyde feed concentration for September are summarized in Table I. The overtime hours for September were 396 compared to 272 in August. The sample count for September was 4538 as compared to 4906 in August. The overtime hours are as follows:

Technician vacation	--	80
Sick relief	--	30
Scheduled overtime	--	120
Holiday	--	72
Environmental	--	9
Nucleant production	--	40
Safety training	--	13
Funeral leave	--	24
Excused with pay	--	8
TOTAL		396

Special analytical support was provided to the following projects:

1. TO-2 Reactor Performance - P. Moede
2. SH-1 Performance - P. Moede/J. Chancellor
3. T-243 Material Balance - J. Chancellor
4. U-10 Support - SH-1 & Natural Finishing

II. CELANEX®:

A. Customer Complaints - Dotson/Tijerina/Hernandez

1. Robinson Electronics complained (P-5573) that they experienced feed hopper plugging due to the large and variable size of the Celanex® 3310 natural pellets (lot 9041661). A return sample was provided the plant for examination.

Plant release records show the lot to be specification material and the pellet quality and configuration to be typical. Examination of the return sample confirmed this initial inspection.

It should be pointed out, however, that the somewhat elongated shape of the Phase I produced Celanex pellets has resulted in complaints of feeding problems from other customers. Efforts are in progress to reduce the pellet size and produce a more uniformly shaped pellet. (DLD-203-79)

2. A complaint (P-5561) was entered by Republic Corp. stating that a shipment delay occurred when their order of Celanex 3300 tan color (lot 9062741) was delivered to the Omega warehouse instead of to them.

   The shipment error was verified and was found to have occurred at the Omega warehouse. The shipment for Republic was segregated from other materials to be unloaded at Omega but the entire shipment was unloaded by mistake. The complaint has been directed to Omega. (DLD-200-79)

At month's end there are no outstanding Celanex complaints on file at the plant.

III. NYLON

A. Customer Complaints - Dotson/Tijerina/Hernandez

1. Monofilaments Inc. entered the precautionary complaint, P-5563, stating that a 1% net weight loss was occurring per bag of Nylon 1200-1 natural due to pellets sticking to the bag liner. This weight loss throws off the customer's proprietary blending process. Samples of the bags were received by the plant for examination.

   The customer's complaint was found to be valid. The pellets when packaged fused to the polyethylene liner of the bag from being too hot. Steps have been taken to prevent a recurrence of the problem. (DLD-202-79)

2. Polymer Corporation stated in complaint P-5559 that they had ordered Nylon N-269 in gaylords but received Nylon 1000-1 in bags instead. Plant records show 1000-1 was shipped at the direction of Distribution. Distribution has been made aware of the complaint. (DLD-201-79)

3. A complaint (P-5564) was entered by Associated Mechanical Devices stating that one 1200 lb. gaylord of Nylon 1000-2 black was found to be regrind and off color material. The box was coded with a Deer Park lot number 8180512 and was part of a shipment of nine gaylords with the remaining gaylords from lots 9012371 and 815271. The gaylord in question was returned to the plant.

Examination of the gaylord confirmed the customer's complaint. Release data from Deer Park indicated this lot of material was specification product on release. Based on our examination, however, it appeared that pulverized rerun material was erroneously boxed under the lot number and was shipped. (DLD-199-79)

4. Nypro Inc. entered a complaint (P-5575) stating that a shipment of Nylon N-269 white from lot 9061331 had excessive black specks. The shipment was returned to the plant.

   The material was released as being within specifications although some black specks were present. Examination of one of the 50 lb. return bags however revealed the black speck count to exceed specifications. The customer's complaint is valid. (DLD-210-79).

5. A complaint (P-5577) was entered by Reynolds Metal Company citing rejection of a shipment of Nylon N-186 due to poorly sealed inner gaylord liners. The lots involved in the shipment were 9062221 and 9062421.

   The plant accepted responsibility for the complaint as sealing problems had been previously identified (DLD-156-79 and DLD-177-79) as having occurred during the time these lots were packaged. The problems have been corrected and extensive measures have been taken to insure proper and complete seals on all gaylord liners. (DLD-209-79)

6. Reynolds Metals Company also entered complaint P-5565 stating that widely varying pellet color was found in a shipment of N-186 natural from lots 9011721 and 9011021.

   Release records showed the material in question to be free of color variability. Examination of our shipping retains revealed some minor pellet to pellet color variability but plaques molded from the pellets were uniform in color and matched the original color values. No further plant evaluation could be made as return samples were not received by the plant. (DLD-208-79)

At month's end, three Nylon complaints remain open.

IV. INDUSTRIAL HYGIENE - Hancock, Pritchard

A. Formaldehyde Survey

The formaldehyde survey in the SH1/TO1 area has been temporarily delayed due to the high priority of the ETOX survey. Previous sample results reveal several exposures to formaldehyde over the 1.5 ppm "action level". The survey will be continued, as will follow-up monitoring.

B. ETOX Survey

The survey for personnel exposure to ETOX continues. Samples are being taken in the SH1, SH2 and MH2 units. Sample results continue to indicate personnel exposures to ETOX are less than 1.0 ppm, 8 hr. TWA. The Celanese internal exposure limit for ETOX is 3 ppm 8 hr. TWA. The highest short term exposure found has been less than 5.0 ppm (obtained while collecting samples). The survey will continue for 2 weeks until all shifts have been monitored. A report will be issued.

C. Particulate - Mass Emissions Sampling

The particulate-mass emissions survey for the Plastics plant has been completed. MS-1146 baghouse in the Celanex Unit was sampled for particulate emissions during the September SEO production run. A final report has been written. These results will be used (by Mr. J. Garza) to complete the TACB emissions inventory. No further work is planned at this time.

D. Fugitive Emissions Monitoring

The SH1 unit was surveyed for fugitive emissions by the laboratory (J. Pritchard) and process engineering (J. Garza) using the Century Organic Vapor Analyzer (OVA-128) and the diluter kit attachment. Pump seals, flanges, valves, etc. were monitored for organic emissions as part of the monthly requirements by TACB. When the OVA method has been finalized, routine measurement of fugitive emissions will be handled by the Maintenance Department.

E. Asbestos Survey

Asbestos monitoring results from the August Celanex Unit SEO production run have been received from National Loss Control Laboratories. All exposures were below the permissible exposure level of 2 fibers/cc. Asbestos monitoring continues in the Celanex Unit during the Sept.-Oct. SEO production run. A final report will be issued when the analytical results are received. No further "routine" asbestos monitoring is planned for the Celanex Unit until first quarter, 1980.

F. Analytical Load

The OSAH/Environmental analytical load, to date, is summarized below.

	Month		YTD	
	OSHA	Environmental	OSHA	Environmental
SH1/TO1	35	66	179	158
SH1/TO2	34	0	262	10
MH2	13	0	132	1
Nat'l. Finishing	0	0	226	2
Special Products	0	0	317	2
Celanex	6	1	68	2
Nylon	0	0	30	1
Chemical Co.	0	0	0	3
	88	67	1,214	179

V. COLOR SERVICE - Artripe/Rothenberg/Harvey

General Summary

Color Service developed 29 color matches this month. The distribution of color match work for each marketing group was 12 Celcon, 11 Celanex, and 6 Nylon matches; of this 9 Celanex, 4 Celcon, and 3 Nylon were made or reworked from existing formulations.

Color Service extruded and shipped one hundred thirty-three (133) pounds of products.

A total of 350 chips were sent out in the process of filling 16 sample requests for chips only.

We have scheduled 18 color matches for October, leaving our backlog of unscheduled work at 44. This backlog is for reformulation of existing formulas. Reformulation is necessary due to pigment obsolescence or chip replenishment. There are no new marketing requests on backlog.

We received approval from Fisher Body for Blue WPH 7130 during the month.

This month we received 2 new color match requests from Fisher Body. This brings Fisher total requests to 12 for 1981 model year.

Scheduled work for Fisher Body slipped behind in September due to failure of the KCS-18. In addition, fadometer testing slows the timing considerably.

Color Service work load remains very high although turnaround time decreased from ≈28 to 17 days.

1. Flammability Testing/Method Update - Rothenberg/Harvey

Flammability testing (UL-94) was reviewed at Summit and Underwriters Laboratories, Melville, L.I. After observing equipment and techniques used for vertical burn testing, it is felt that correlation of test results between Bishop, Summit and UL should be excellent, although some testing differences were identified. Several parameters in testing were deemed especially important by UL, with the single most significant factor being draft conditions in the hood where testing is done. Bishop will slightly modify their test hood to more closely conform to UL's conditions.

2. Review of Physical Testing at Summit and Bishop - Rothenberg/Harvey

Physical testing at Bishop and Summit was reviewed. Overall, physical testing at both labs is very similar with procedures at both sites based on ASTM test methods. While some differences were found in test specimen conditioning, a major difference in determining tensile yield and break of unfilled Celanex was discovered. For the past several years, Bishop has run this material at a crosshead speed of 0.2 inches/minute. Summit runs this material at a crosshead speed of 2.0 inches/minute. When determining tensile properties, an increase in crosshead speed will increase tensile strength and decrease elongation. This difference is being discussed with Summit personnel and a uniform crosshead speed will be agreed upon. (RGR-78,79-79)

3. Celanex® Color Information - UL All-Color Approval - Rothenberg

Information on black, white, and red Celanex color formulations having the highest level of organic and/or inorganic pigments was furnished to A. Serle (Summit). This data will be used to obtain UL approval for new Celanex products recently introduced to UL. (RGR-80-79).

4. Addition to Approved Pigment List - Rothenberg

Sun Chemical "Sunfast" Carbazole Violet 246-1670 organic pigment has been approved. This pigment is necessary for color formulation work in Celcon (General Motors colors) and is classified as a carbazole dioxazine violet pigment.

5. Black Nylon - Rothenberg/Artripe

Extensive work is being done with black pigments and dyes to find a replacement for Neozapon Black RE dye in Nylon. Neozapon Black RE turns to a blue-black at high processing temperatures and is expensive to use, with the current price at $12.05/lb. Data is still being evaluated and compiled. A report will be issued.

VI. PERSONNEL

P. J. Moede attended a corporate sponsored seminar on college recruiting September 23rd - 25th in Charlotte, N.C. Ms. Moede will be an alternate campus recruiter for the coming year.

R. G. Rothenberg conducted a series of safety meetings for the department on Safety in the Color Lab and Pigment Handling.

R. L. Bunkley

RLB:slh

Attachments

SAMPLE COUNT

TABLE I

MONTH September, 1979

Area	No. Sples. Celcon® Routine	No. Sples. Celcon® Non-Routine	No. Sples. Celcon® Total	No. Sples. Celanex® Routine	No. Sples. Celanex® Non-Routine	No. Sples. Celanex® Total	No. Sples. Nylon Routine	No. Sples. Nylon Non-Routine	No. Sples. Nylon Total	Total (All Types)	% of Total (All Types)
TO-1	282	169	451							451	10.0
TO-2	448	506	954							954	21.1
SH-1	286	184	470							470	10.3
SH-2	325	132	457							457	10.1
MH-2	247	0	247							247	5.5
Natural Finishing	625	0	625							625	13.8
Special Products	336	0	336							336	7.4
Celanex				222	0	222				222	4.9
Pilot Plant	0	0	0							0	0.0
Raw Materials	148	0	148							148	3.3
QC	58	0	58							58	1.3
Nylon							528	32	560	560	12.3
Others	0	0	0							0	0.0
TOTALS	2755	991	3746	222	0	222	528	32	560	4528	100.0

Overtime:

	Month	YTD
Regular	324	2897
Holiday	72	376
TOTAL	396	3273

® Reg. T.M.

HCHO Feed Ave. Conc. 48.95
Hi 54.72
Low 44.93

HCHO Feed Ave. HCOOH 0.053
Hi 0.091
Low 0.032

HCHO Feed Avg. MeOH 0.48
Hi 1.11
Low 0.18

Total Samples (All Types) 4528

Routine	3505	77.4
Non-Routine	1023	22.6

Total Sples YTD 45,115

TABLE II

Celcon Quality Summary

	September		Year to Date	
	M Lbs	Percentage	M Lbs	Percentage
Gross Production	7016.6	100.0	65428.3	100.0
Total Packaged Off Specification	2182.0	31.1	19510.6	29.8
Quality Waivers	2135.7	30.4	16513.8	25.2

TABLE III

Celcon Experimental Products

Product	Production	Releases
C155	66600	66600
C240A	232915	232915
C243	136350	136350
C251	79200	79200
C267	12000	12000
C271	5650	5650
C272	15450	15450

TABLE IV

Analysis of Celcon Packaged Off Specification

Natural Finishing - September

Defect	Lots	Quantity M Lbs	% of Total Natural	Lots	Quantity M Lbs	% of Total Natural
Melt Index	7	761.9	11.8	90	7963.9	15.0
Discolored Pellets	2	347.8	5.4	27	1517.0	2.8
Black Specks	3	383.8	5.9	36	3355.4	6.3
Stabilizer Content	1	179.6	2.8	20	1293.0	2.4
Ash Content	2	66.6	1.0	3	94.9	0.2
Natural Color	3	346.0	5.4	26	2310.9	4.4
Ext. HCHO	1	39.4	0.6	6	191.4	0.4
10X Melt Index	0	0	0	3	56.1	0.1
Kd	0	0	0	6	532.1	1.0
Volatiles	0	0	0	6	205.8	0.4
Off Size Pellets	2	327.7	5.1	8	1242.3	2.3

Special Products - September

Defect	Lot	Quantity M Lbs.	% of Total S. P.	Lots	Quantity M. Lbs.	% of Total S. P.
[illegible]t Index	2	21.7	3.7	86	1231.4	9.9
[illegible] colored Pellets	1	3.0	0.5	21	209.0	1.7
Color Match	2	4.8	0.8	23	141.5	1.1
Off Size Pellets	3	26.3	4.5	53	676.4	5.4
Colored Pellets (Contamination)	1	13.8	2.3	7	39.0	0.3
Volatiles	1	2.4	0.4	11	146.1	1.2
Stabilizer Content	0	0	0	13	424.4	3.4
Kd	2	36.7	6.3	31	214.4	1.7
Black Specks	0	0	0	1	9.4	0.1
Tensile Strength	0	0	0	21	299.1	2.4
Natural Color (Glass Filled)	1	14.8	2.5	26	364.6	2.9
Ash Content	0	0	0	5	38.4	0.3

TABLE V

Celcon Releases

Formulation	Releases Quantity (M Lbs.) Sept	YTD	Lots Sept	YTD	Quality Waivers Quantity (M Lbs.) Sept	YTD	Lots Sept	YTD
M9000 Flake	0	26.8	0	3				
M9001 Flake	806.6	2202.8	64	182				
M27000 Flake	0	24.9	0	2				
M2501 Natural	273.6	1154.7	2	19	159.2	570.3	1	10
M2504 Natural	183.3	1780.1	1	29		1045.3		15
M2514 Natural	0	25.7	0	1				
M50 Natural	101.0	101.0	2	2				
M9004 Natural	3806.0	28678.9	30	236	936.1	7937.9	7	62
M9014 Natural	471.6	3263.8	3	34	379.3	1239.5	2	12
M90210 Natural	0	178.6	0	6		85.1		3
M14014 Natural	0	172.8	0	2				
C143 Natural	235.0	3524.3	2	40	156.8	746.2	1	7
M27004 Natural	465.0	3182.9	3	23		335.5		3
M27014 Natural	0	1788.8	0	29		341.1		8
U1011 Natural	14.4	504.0	1	19	14.4	427.1	1	16
M2501 Color	0	21.8	0	2				
M2504 Color	0	56.0	0	3		35.9		2
M9004 Color	65.8	1669.1	10	158	2.5	274.9	1	28
M9014 Color	0	22.6	0	3		1.9		1
M9008 Color	3.5	101.8	1	10				
M9008 Natural	22.0	261.2	2	17		14.2		1
M9034 Color	43.5	358.6	3	21		177.3		10
M14014 Color	0	93.4	0	7				
C143 Color	25.2	174.2	3	24		34.9		6
M27004 Color	0	110.0	0	11		2.6		1
M27008 Color	20.9	281.3	4	46		86.6		7
M27014 Color	6.3	6.3	1	1				
M2504 Black	57.5	216.7	4	19	13.5	105.5	1	4
M9004 Black	0	2507.2	0	74		373.4		10
M9014 Black	23.2	577.7	1	30	23.2	293.9	1	13
C143 Black	0	236.2	0	16		16.1		1
M27004 Black	0	380.6	0	17		69.7		4
M27014 Black	0	30.9	0	2		16.4		1
U1011 Black	0	65.2	0	5				
GC25A Natural	83.6	887.1	7	67	14.8	317.4	1	23
GC25A Black	0	1613.2	0	71		12.7		1
M9007 Color	39.8	265.7	12	76				
M9007 Black	32.5	247.9	3	13				
Salt & Pepper	63.5	1238.8	5	90				
C155	66.6	191.3	2	7	66.6	151.9	2	5
C234A	0	964.3	0	35		143.0		5
C240A	232.9	735.5	2	6	232.9	326.7	2	3
C241	0	64.7	0	4		18.2		1
C243	136.4	781.8	1	12	136.4	399.0	1	4
C244	0	3275.9	0	38		622.6		9
C251	79.2	466.8	1	9		285.6		4
C252	0	176.4	0	2				
C254	0	12.6	0	1				
C255	0	5.0	0	1				
C257	0	12.0	0	1				
C267	12.0	62.9	1	6				
C271	5.6	5.6	1	1				
C272	15.4	15.4	1	1				
C273	0	5.4	0	1		5.4		1
C300	0	1007.5	0	10				
C301	0	542.6	0	5				
TOTALS	7391.9	66359.3	173	1550	2135.7	16513.8	21	281

	Month	YTD
% Color	2.53	4.76
Black	1.09	7.52
Other	11.77	5.26
Glass Filled	1.13	3.77
Natural	82.50	77.92
Concentrates	0.98	0.77

QUALITY WAIVERS

Month	YTD
28.9	24.9

TABLE VI

Celanex Quality Summary

	September		Year to Date	
	M Lbs.	Percentage	M Lbs.	Percentage
Gross Production	1,699.9	100.0	17,786.3	100.0
Total Packaged Off Specification	118.3	6.9	1,553.8	8.7
Quality Waivers	50.3	3.0	934.8	5.3

TABLE VII

Analysis of Celanex Packaged Off Specification

Defect	September			Year to Date		
	Lots	M Lbs	% of Production	Lots	M Lbs	% of Production
Flammability	1	30.7	1.8	16	404.5	2.3
Discolored Pellets	0	0	0	5	52.3	0.3
Ash Content	3	73.1	4.3	30	671.8	3.8
Off Size Pellets	0	0	0	2	62.8	0.4
Volatiles	0	0	0	1	39.4	0.2
Contamination	2	14.4	0.8	8	141.4	0.8
Color Match	0	0	0	7	95.3	0.5
Unfilled Pellets	0	0	0	3	101.5	0.6

TABLE VIII

Celanex Releases

Formulation	Releases Quantity (M Lbs) Sept	Releases Quantity (M Lbs) YTD	Releases Lots Sept	Releases Lots YTD	Quality Waivers Quantity (M Lbs) Sept	Quality Waivers Quantity (M Lbs) YTD	Quality Waivers Lots Sept	Quality Waivers Lots YTD
2000 Natural	0	25.9	0	2				
2000-2 Natural	0	326.2	0	31				
2002-2 Natural	30.1	48.5	3	5				
2012 Natural	74.3	322.8	6	26				
2012-2 Natural	29.9	209.3	3	20				
3200-2 Natural	0	38.9	0	1				
3210 Natural	81.2	1230.6	2	60		30.4		2
3210-2 Natural	54.0	316.2	2	16				
3211-2 Natural	0	39.5	0	1				
3300 Natural	281.4	4251.7	11	143	50.3	402.8	2	12
3300-2 Natural	0	102.5	0	3				
3310 Natural	95.1	2105.8	5	89		91.3		6
3310-2 Natural	71.4	566.1	2	25		68.4		3
3311 Natural	0	15.0	0	1				
3311-2 Natural	0	47.0	0	1				
2002-2 Black	7.0	7.0	1	1				
3200 Black	56.4	463.4	2	14				
3210 Black	60.5	324.0	2	15		19.5		1
3210-2 Black	0	102.2	0	5		25.5		1
3300 Black	624.6	4780.5	8	63		194.2		5
3300-2 Black	0	29.6	0	2				
3310 Black	82.2	486.3	2	27		34.7		2
3310-2 Black	61.9	251.7	2	14		20.4		1
3311-2 Black	0	54.4	0	2				
3300 Color	105.8	380.8	7	29		47.6		4
3300-2 Color	0	41.6	0	3				
3210-2 Color	0	21.1	0	1				
3310 Color	38.0	160.7	3	11				
3310-2 Color	0	144.6	0	9				
3311-2 Color	0	53.7	0	4				
J225	0	9.7	0	1				
J226	0	7.5	0	1				
J227	0	13.0	0	1				
J228	0	13.0	0	1				
J240	0	4.4	0	1				
TOTALS	1753.8	16995.2	61	635	50.3	934.8	2	37

QUALITY WAIVERS

2.9	5.5
Month	YTD

TABLE IX

Nylon Quality Summary

	September		Year to Date	
	M Lbs	Percentage	M Lbs	Percentage
Gross Production	1475.0	100.0	21171.7	100.0
Total Packaged Off Specification	536.4	36.4	7811.7	36.9
Quality Waivers	466.6	31.6	6569.5	31.0

TABLE X

Nylon Experimental Products

Product	Production	Releases
N224	294895	294895
N265 Nat.	17950	17950
N265 Black	21300	21300
N269	169660	169660
N276 Nat.	12350	---
N276 Black	2050	2050
N277 Nat.	9250	9250
N277 Black	5950	5950
N355	134065	134065

TABLE XI

Analysis of Nylon Packaged Off Specification

Defect	September			Year to Date		
	Lots	M Lbs	% of Production	Lots	M Lbs	% of Production
Relative Viscosity	12	189.6	12.8	191	3799.9	17.9
Volatiles	13	274.3	18.6	150	2931.5	13.8
Ash Content	3	28.6	1.9	15	256.6	1.2
Discolored Pellets	3	25.7	1.7	16	150.7	0.7
Off Size Pellets	0	0	0	29	578.4	2.7
Natural Color	3	82.3	5.6	33	719.9	3.4
od Impact	0	0	0	14	316.9	1.5
Nucleant	0	0	0	15	293.1	1.4
Copper	0	0	0	2	42.5	0.2
Black Specks	2	42.5	2.9	7	86.0	0.4
AEG	0	0	0	1	21.6	0.1
Iodine	0	0	0	2	39.3	0.2

TABLE XII

Nylon Releases

Formulation	Releases				Quality Waivers			
	Quantity (M Lbs)		Lots		Quantity (M Lbs)		Lots	
	SEPT	YTD	SEPT	YTD	SEPT	YTD	SEPT	YTD
1000-1 Natural	140.2	768.5	7	38	66.3	211.4	3	10
1000-2 Natural	449.1	2457.9	21	122	127.0	513.8	6	26
1000-4 Natural	41.0	833.4	2	42		116.4		6
1003-1 Natural	0	553.2	0	27				
1003-2 Natural	0	1064.4	0	54		181.8		9
1200-1 Natural	0	448.7	0	42		228.7		21
1300-1 Natural	0	58.0	0	3				
1310-1 Natural	0	33.0	0	2		22.0		1
1310-2 Natural	0	1528.3	0	75		228.2		11
1310-4 Natural	0	616.9	0	29		207.0		10
1400-2 Natural	0	63.0	0	3				
1403-2 Natural	0	32.9	0	1				
1500-2 Natural	0	357.7	0	12		130.7		4
1503-1 Natural	0	284.3	0	9		252.2		7
1503-2 Natural	526.1	1792.3	25	73	264.1	1336.8	13	51
1600-2 Natural	0	103.0	0	4		74.7		2
1603-2 Natural	0	24.9	0	1				
1000-2 Black	0	529.0	0	34		456.6		31
1003-2 Black	0	532.6	0	30		450.7		25
1310-2 Black	0	621.0	0	33		400.9		21
1503-1 Black	0	39.2	0	1		39.2		1
1503-2 Black	0	2378.3	0	73		847.9		26
1603-2 Black	0	108.8	0	4		42.9		2
1503-2 Color	0	72.6	0	6				
1603-1 Color	21.6	442.1	2	36		26.7		2
1603-2 Color	0	12.6	0	1		12.6		1
N181	0	830.8	0	40		21.6		1
N184	0	62.0	0	4				
N186	0	443.2	0	46		71.4		7
N198	0	41.2	0	2				
N224	294.9	1881.0	14	92		85.3		4
N243	0	782.4	0	39		272.3		14
N245	0	212.8	0	11				
N249	0	17.0	0	2				
N265 Natural	17.9	22.8	2	3				
N265 Black	21.3	21.3	2	2				
N269	169.7	691.7	8	34				
N270	0	192.5	0	9				
N273	0	147.5	0	7				
N276 Natural	0	4.7	0	1				
N276 Black	2.0	2.0	1	1				
N277 Natural	9.2	15.0	1	2	9.2	9.2	1	1
N277 Black	5.9	15.4	1	2				
N355	134.1	1001.5	7	52		290.1		15
N357	0	315.6	0	5		38.4		1
TOTALS	1833.0	22457.0	93	1111	466.6	6569.5	23	310

QUALITY WAIVERS

25.4	29.2
Month	YTD