

BUSINESS CONFIDENTIAL

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other*

**TECHNOLOGY MANAGER'S
REPORT**

TO: Mr. C. R. Field

**BUSINESS DEPARTMENT 22
BUSINESS AREA 223**

FROM: F. A. DeMelio

DATE: August 5, 1967

WIRE AND CABLE MATERIALS

HIGHLIGHTS

POLYSULFONE FILM FOR EHV CABLE

As a consequence of favorable test results from the 500 KV Polysulfone/oil cable manufactured about two years ago, Anaconda has contacted us concerning the purchase of 5,000 pounds of embossed Polysulfone film for delivery this year.

A. A. D'Onofrio

NATURAL VULCANIZABLE POLYETHYLENE

The recent truckload of free-flowing HFDA-4208 Nt. to Kaiser, Bristol was an unqualified success. As a result we obtained another 30,000 lb. order.

E. L. Schmidt, J. F. Groel

VULCANIZABLE EVA COPOLYMERS

Rome (URD insulation) and Belden (ignition wire insulation) were sampled with HXFD-2604 Nt this month. Extrusion and cure speed trials were run off in our presence on Rome's laboratory horizontal C. V. with excellent results. A new high purity base resin specification is being written for this compound.

R. L. Brockett, J. F. Groel, A. A. D'Onofrio

**Research and Development Department
Chemicals and Plastics
Union Carbide Corporation
Bound Brook, New Jersey**

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042297

Highlights Continued

SEMI-CONDUCTIVE POLYETHYLENE

A 500 pound sample of DXHD-3240, the new thermoplastic semiconductive compound, was evaluated by Kaiser. Results of their extrusion trial were excellent and indicate that 3240 will solidify our position in the semiconductive shielding market. Long term heat aging and load cycling is in progress by Kaiser.

R. L. Brockett

FAST CURING RESIN-ALLYL ESTER OF POLYMER H

Unusually fast cures and low deformations were obtained with peroxid crosslinked allyl esters of Polymer H. This may be the faster curing base resin for vulcanizable polyethylene that we've been looking for provided (1) it can be extruded without scorch and (2) we can commercially make the allyl ester.

E. J. Fisher, E. F. Bonner

S RESIN SINGLES

An "S" Copolymer (DEX-7402, 0.22 MI, .955 density) was compounded in the #9FCM (Bay 6) at 7000 lbs./hr. to give impressive changes in wire extrusion and blow molding characteristics. The high molecular weight tail was chopped off in the process as evidenced by a drop in IV from 2.5 to 2.0. Surfaces of wire extruded at high speed were smoother than for DGDA-3363, our insulation compound. Swell, as measured by the weight of 1/2 gal. blow molded bottles was reduced from >100 to 72 g. (H. Samuels)

R. J. Turbett

FLEXOL R 3 M (MODIFIED)

Lauric acid and urea-treated 2-ethylhexanoic acid terminated R3M polymeric plasticizers were compared to the original R3M (untreated 2-ethylhexanoic acid cap) and Santicizer 409 for high speed mill heat stability. The lauric capped plasticizer provided heat stability in a Ba-Cd-Zn stabilized compound equivalent to S-409. In lead stabilized compounds, the lauric terminated R3M was not as good as S-409 but a satisfactory improvement over the original R3M.

A cursory check on the effect of the capping agent interchange on the processing and end-properties of a vinyl compound containing these plasticizers will be performed.

E. B. Harris

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042298

Polyethylene For Power Cable
Bound Brook (F. A. DeMelio, A. A. D'Onofrio)
July, 1967

HIGH VOLTAGE INSULATIONS

1. Polysulfone Film for EHV Cable

As a consequence of favorable test results from the 500 KV Polysulfone/oil cable manufactured about two years ago, Anaconda has contacted us concerning the purchase of 5,000 pounds of embossed Polysulfone film for delivery this year.

Preliminary electrical test data by Tom Hazen indicate that the recent P-3500 film prepared in Bound Brook has excellent electrical properties for EHV applications. Arrangements will be made to resample General Cable, Bayonne.

A. A. D'Onofrio

2. HFDA-4208 Natural

The recent truckload of free-flowing HFDA-4208 Nt to Kaiser, Bristol was an unqualified success. As a result we obtained another 30,000 lb. order.

E. L. Schmidt, J. F. Groel

3. Natural Vulcanizable Copolymer

Rome (URD insulation), and Belden (ignition wire insulation) were sampled with HXFD-2604 Nt this month. Extrusion and cure speed trials were run off in our presence on Rome's laboratory horizontal C. V. with excellent results. A new high purity base resin specification is being written for this compound.

It has been determined that HXFD-2604 Nt, even though it is stabilized with polymerized trimethyl-dihydro-quinoline, does not exhibit the "halo" effect noted with homopolymer insulations containing this staining antioxidant.

R. L. Brockett, J. F. Groel,
A. A. D'Onofrio

MEDIUM AND LOW VOLTAGE INSULATION

Production of wire samples insulated with HXFD-3226 for the Underwriters submittal has begun at Hatfield Wire and Cable. We are still searching for a customer who will fabricate the necessary U. L. samples from HXFD-3227 (the 60 part equivalent).

R. L. Brockett

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Polyethylene For Power Cable
Bound Brook (F. A. DeMelio, A. A. D'Onofrio)
July, 1967

2.

TRACK RESISTANT INSULATIONS

Recommendations were made to Olin Conductors to assist them in writing up specifications to cover HFDA-4215 Grey vulcanizable polyethyl n copolymer for aerial cable insulation.

J. F. Groel

SEMI CONDUCTIVE POLYETHYLENE

A 500 pound sample of DXHD-3240 was shipped to Kaiser, Bristol during this period. Kaiser has already completed their insulation shield evaluation on production equipment and reported that DXHD-3240:

- a. gave high outputs at low temperatures,
- b. drew down well with no breaks
- c. gave a tight fit,
- d. did not exhibit objectionable adhesion,
- e. demonstrated excellent resistivity after fabrication, and
- f. demonstrated a slightly pimply surface.

Kaiser plans a few weeks of heat aging and electrical studies before final approval.

R. L. Brockett

AUTOMOTIVE INSULATIONS

1. Vulcanizable

The July production run of HFDA-4730 Nt for the most part yielded saleable product which gave excellent extruded surfaces and did not exhibit the speckled burnt appearance in press cured plaques. One section of this run did give a poorly dispersed product; however, this was quickly traced to a wet blender seat-out problem. We have not yet been able to precisely pin down the cause of the QYNV agglomeration problem which ruined almost the entire June production run.

R. L. Brockett, P. Hassialis

Recent information from Essex Wire and Cable points out that Ford Motor Company has issued a specification regarding crosslinked polyethylene for primary wire. Samples of vulcanized polyethylene, vinyl and hypalon for comparison abrasion testing have finally been received from Essex. It has been agreed that meetings with Chrysler and Essex regarding HFDA-4730 Nt. would be beneficial.

R. L. Brockett

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042300

Polyethylene For Power Cable
Bound Brook (F. A. DeMelio, A. A. D'Onofrio)
July, 1967

3.

A new Product Data bulletin describing the utility, properties and fabrication requirements of HFDA-4730 Nt is in press.

J. Peterson, R. L. Brockett

2. Thermoplastic:

a. Additional work has been done on the EVA silica system to produce an insulation for under the hood auto harness wiring. We continue to look at the addition of chlorosulfonated polyethylene, EVA chewing gum stock and trace amounts of peroxide to obtain the desired physical and extrusion properties along with the high temperature deformation resistance demanded by Packard's short circuit test. Variability in both extrudability and porosity continue to be the major problems.

b. Our initial studies with ethylene acrylic acid copolymers and reactive fillers have been somewhat discouraging. Work continues.

E. L. Schmidt

NEW VULCANIZABLE COPOLYMERS

The preliminary evaluation of a 5.0 melt index, ethylene bicycloheptane copolymer as the base resin for an unfilled vulcanizable insulation was quite encouraging. As a result we have requested larger quantities of devolatilized C₂/BCH copolymer for formulation and extrusion studies.

R. L. Brockett

FAST CURING BASE RESIN FOR CROSSLINKING - ALLYL ESTERS

Work is continuing on the evaluation of allyl esters of polymer H as fast curing base resins. Esters of DXM-235 (14% AA 50 MI) and DXM-242 (3% AA, 3 MI) are in the process of being evaluated. In each case, the cure is faster. The ester made with DXM-235 cures very rapidly. At the normal peroxide level and one half the cure cycle the following information has been obtained:

<u>Resin</u>	<u>% Deformation</u>
DXM-235 allyl ester	12
DXM-242 allyl ester	36
HFD-4208 control	44

E. J. Fisher, E. F. Bonner

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Polyethylene For Power Cable
Bound Brook (F. A. DeMelio, A. A. D'Onofrio)
July, 1967

4.

BICYCLOHEPTYL ACRYLATES

We have evaluated copolymers of ethylene and bicycloheptyl acrylate (DEX-1061-1063) and 2-ethylene hexyl acrylate (DEX-1070) and have found that these materials cure slower than our standard material HFDA-4208. As a result, no further work on these copolymers will be attempted.

E. J. Fisher, So. Charleston Personnel

EXPERIMENTAL PEROXIDE

Various materials were investigated as cure accelerator for Y. L. Fan's experimental peroxide (α α -dimethylbenzylperoxy) silane. None of these materials appeared to improve the cure beyond a level of 80% deformation at cure temperatures as high as 190°C. Y. L. Fan reports that triallylcyanurate in high density formulations greatly improves the degree of cure. Perhaps this material will be the basis of a new high density crosslinkable material.

E. J. Fisher

VULCANIZABLE (GENERAL)

New Peroxides

The evaluation of new peroxides for vulcanizable polyethylene systems continues. The most recent data on the new peroxides from Hercules & Noury and Vander Lande indicate they have very little adverse effect on dissipation factor and dielectric constants. An extrapolation of the cure rate versus temperature curves indicate that the new compounds are more scorch resistant than the dicumyl peroxide controls and could probably be processed or extruded 30°C higher in temperature. We plan to evaluate the Hercules product in a battery cable application for Packard Electric once they decide what type of filled compound they need for the job.

E. L. Schmidt

Trips

7/12	Philadelphia Electric	A. D'Onofrio	Spacer Cable
7/18	Kaiser Aluminum	A. D'Onofrio	Power Cable
		R. Brockett	Insulations
7/26	Rome Cable	A. D'Onofrio	URD Cable
7/20	Hatfield Wire & Cable	R. Brockett	Underwriters
			Submittal

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Polyethylene For Power Cable
Bound Brook (F.A. DeMelio, A.A. D'Onofrio)
July, 1967

5.

Visitors And Training

<u>Date</u>	<u>Visitor</u>	<u>Host</u>	<u>Subject</u>
7/5	SHOWA Cable (Japanese)	A. D'Onofrio	Power Cable
7/14	NKF (Holland)	A. D'Onofrio	Power Cable
7/17	Siemens Elec. (German)	A. D'Onofrio	Power Cable
7/19	DKAG (Austrian)	A. D'Onofrio	Power Cable
7/20	Sales Trainees	A. D'Onofrio	Power Cable
7/17-			
7/19	Sales Trainees	E. Schmidt	Wire & Cable General

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TELEPHONE CABLE

Low Pressure Products

Jackets

1. Carbon Black Dispersions - Work to date has shown that commercially acceptable dispersions of raw carbon black in high density polyethylene are obtained in both Farrel Continuous Mixers and in a Banbury Mixer using a dry preblend of black with "S" copolymer fluff. A scale-up run in a #9 FCM (Bay 5) is planned for later this year.

Except for a trial in the #4 FCM with fluid bed fluff (all other trials have been with loop reactor resin), the experimental phase of this project is being terminated. We learned in a recent High Density Operations Team Meeting that fluff handling facilities will not be installed at Bound Brook, and compounding equipment for making jacket compounds from black/fluff will not be available in Seadrift until early 1970; so, as it stands now, the new process will not be implemented for several years.

2. Ocean Cable Jacket - A trial quantity of DGDJ-3469 Bk was sent to CdL in France for evaluation as ocean cable jacketing. In the first 6 mile length an "excellent tight fit" was obtained of jacket to the return conductor and electricals were good. At this time it appears that this "S" copolymer has a good chance of replacing DGDA-3110 which is a 0.2 melt index SF resin, difficult and costly to produce.

R. J. Turbett

3. Void Problem - DGDJ-3466 - Our investigation of high density polyethylene concerned itself with the elimination of voids from DGDJ-3466. Vacuum heating failed to improve elongation values. It is thus felt that a low MW polyethylene fraction, rather than a solvent such as pentane, is responsible for void formation.

Plaques molded from natural fluff also exhibited erratic elongations. This indicates that low MW fractions are generated in the reactor rather than during subsequent processing operations.

W. J. Launder

4. DGDJ-3466 Bk 9845 - General Cable - General Cable has not approved DGDJ-3466 Bk 9845 as their heat aging tests at 100°C indicated the product is lacking in thermal heat stability. The problem is currently under investigation at Bound Brook. It probably relates to the erratic nature of elongation values obtained on compression molded specimens rather than to thermal stability.

J. F. Groel, R. Turbett

5. DGDA-3466 Nat - Western Electric, Baltimore - Tests at Bound Brook failed to confirm the Western Electric, Baltimore complaint that two blends of DGDA-3466 Nat failed the 14 day, 100°C boiling water stress crack resistance requirement of specification 59062, Issue I. Due to the vacation shutdown at W. E., Baltimore, no additional customer data is available on the more recent shipments of 3466 Nat. However, both Bound Brook and Seadrift data indicates compliance with this requirement. A round robin will be suggested if the Western data continues to indicate that a problem exists.

J. F. Groel, Seadrift

Insulation

S Resin Singles - An "S" Copolymer (DEX-7402, 0.22 MI, .955 density) was compounded in the #9 FCM (Bay 6) at 7000 lbs./hr. to give impressive changes in wire extrusion and blow molding characteristics. The high molecular weight tail was chopped off in the process as evidenced by a drop in IV from 2.5 to 2.0. Surfaces of wire extruded at high speed were smoother than for DGDA-3363, our insulation compound. Swell, as measured by the weight of 1/2 gal. blow molded bottles, was reduced from >100 to 72 g. (H. Samuels).

There is some question as to where double processing fits into the high density picture for the next few years. It is planned to stay with an SF/PF blend for wire insulation (-3363) until an FCM is available at Seadrift early in 1969, at which time conversion to an "S" product will be made. However, if PF reactor capacity and FCM compounding capacity at Bound Brook are available (i.e., if equipment would otherwise be idle), then double processing of "S" copolymer to produce -4300 type blow molding resins could be advantageous. The added cost of double processing would be balanced by reduced plant costs for resin and elimination of royalties to Phillips.

This would be an interim process only; it is predicted that FCM compounding of "S" fluff at Seadrift will give the desired balance of properties for both wire insulation and blow molding.

R. J. Turbett/Mfg. Personnel

High Pressure Polyethylene

Jackets

1. Carbon Black Dispersion - In order to reduce the manufacturing cost of some of our less critical black compounds, we are evaluating methods of adding raw carbon black, thereby eliminating the cost of the masterbatch (about .75¢/lb. with DFD-4165). Although we had reasonable success in the laboratory by premixing the black with powder d DYDT wax, the same technique was not successful in a production Banbury. The problem seems to be related to a small percentage of poorly dispersed black in the mix as well as contamination from raw black which will invariably accumulate in a production situation. Our next step will be to evaluate the Farrel Continuous Mixer which is, we believe more appropriate for raw black addition.

N. M. Burns

2. Vinyl Acetate Copolymer Jacket - EVA-508 (irradiated ethylene vinyl acetate copolymer) has been screened as a communications cable jacket product for the Naval Ship Systems Command. It is a very flexible material of 4200 psi torsional modulus. The tensile properties are good and equivalent to existing jacket products. Low temperature brittleness was very good; superior to existing jacketing products in the screening test. EVA-508 is a soft product. Thus, it is readily subjected to wear and loses mechanical strength above 50°C. Our results will be passed on to the Navy.

N. M. Burns

3. DFDC-0506 Bk 9845 - Torrance Production - Quality of DFDC-0506 Bk 9845 produced in Torrance continues to be good. Productivity of the DXH-28 base resin is now at the 1900 to 2000 lb/hr. level which compares favorably with the rates obtained at Whiting when they employed 1" reactors. We continue to run many of the quality control tests for Torrance. However, they now have all the necessary equipment and we should be able to phase out in the near future. Arrangements are being made to ship a hopper car of DFDC-0506 Bk 9845 to Western Electric, Hawthorne in order to obtain Western approval for the Torrance Plant.

J. F. Groel, Torrance

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042306

General

Carbon Black Dispersion in PE -

Invention letter 67-67 was written covering a method for adding raw carbon pigment to polyethylene resin in powder form and obtaining quality pigment dispersion. Potential savings of one to two cents per pound of product have been predicted if this process can be scaled up and adapted by manufacturing.

E. L. Schmidt.

CELLULAR

1. DFD-4960 - Bound Brook Production - Expanded density data run by Ottawa quality control on the Bound Brook Production of DFD-4960 confirmed our results of good quality product and also indicates good uniformity. The compound containing 1.1% blowing agent is presently under evaluation at Times Wire and Cable.

A report covering the recent Production run in Bay 3 has been issued.

E. J. Fisher, H. J. Pazinski

2. DFDB-6660 - Anaconda - A favorable extrusion evaluation of DFDB-6660 on a .500" core cable has been reported by Anaconda Wire and Cable. Expanded densities in the range of .34 were obtained. Complete results of the evaluation and potential economics are being studied by the customer.

H. J. Pazinski

3. DFDB-6660 - General Cable - General Cable has ordered 5,000 pounds of the DFDB-6660 for an extensive evaluation at their Tampa plant.

H. J. Pazinski

4. Plate-Out - We have been able to detect slight plate-out on the tip and die of our 2-1/2" Royle extruder with our new cellular compound DFDB-6660 Natural. The plate-out is due to residue products of the azodi-carbonamide (Kempore R-125) and identified from the literature as Urazol, biurea, cyanuric acid and cyamelide.

It is objectional since it may result in a rough extruded surface and in some cases die erosion. This results in downtime to the customer. A program to determine if we can minimize or eliminate plate-out with this new cellular compound is under way.

H. J. Pazinski

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042307

Polyethylene For Communications Cable
Bound Brook (F. A. DeMelio, A. A. D'Onofrio
July, 1967

10.

Visitors

<u>Date</u>	<u>Visitor</u>	<u>Host(s)</u>	<u>Subject</u>
6/30	General Cable	J. Groel H. Pazinski B. Maddock	Cellular Polyethylene -discussion of fluted screw
7/17 to	Sales Trainees	E. L. Schmidt	Introduction to Wire & Cable
7/19	"		
7/20	"	N. M. Burns	Jacketing Compounds
7/21	"	H. J. Pazinski	Cellular
7/21	"	R. J. Turbett	High Density PE
7/24 to	"		
7/28	"	J. F. Groel	General Wire & Cable & Extrusion Training

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042308

W/C. Compounds for MIL-C 8777 and 3702

First plant scale compounding trials of insulation for 8777 wire show formulation adjustments in modifying fluid and stabilizer levels are needed to compensate for effects of large scale intensive mixing. Formulation adjustments are being investigated.

Electrically Conductive Silicone Rubbers

Study of factors affecting reproducibility of K-1516 and Y-3087 conductive rubbers shows polymer lites content to be important. Variations in alkaline polymerization and peroxide curing catalysts were not significant in effect. UCET conductive black is equivalent to Shawinigan brand in performance.

Critical Performance Properties

Aging at Subcritical Temperatures: A film forms on the exposed surfaces of silicone rubbers aging at subcritical temperatures. When aged rubber is stretched, cracks initiate in the film and penetrate the mass to cause premature shear failure. The film appears to be generated by degradation of the rubber polymer by the atmosphere; fillers and other elastomer components are secondary in effect. The film has now been isolated as a soft, elastic, weak membrane much like lightly cross-linked pure gum; analysis of the isolated film is in progress. Improved techniques now detect film formation in as little as 5 days aging; longer exposures are needed for film thickness to build sufficiently for isolation.

Resilience: First plant scale mixing trials with K-1235 modified with tin for increased resilience were not successful. Both processing and performance properties of the product mixes differed considerably from those expected. Raw materials and mixing process variables are being investigated.

Examination of the effects of postcure intensity on elastomer hysteresis shows that postcure of any degree is harmful and will tend to decrease resilient response. For maximum resilience, elastomers of the single-cure type should be sought.

Belden Manufacturing Co.

In recent trials, Belden extruded Y-3087 conductive silicone rubber on 17,000 feet of glass cord. Insulation and jacket compounds were extruded on the conductive core to form ignition wires of three quality levels. There were no processing problems at any point in the runs. Resistivity of postcured wire stabilized at 4,000 ohms/foot, well within F.C.C. requirements. If satisfactory dielectric strengths are obtained, Belden will review for action at their next product meeting.

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Plasticizers and Dry Blend Resin For Wire & Cable
Tarrytown (W.H. Bauer)
July, 1967

12.

Chlorinated Polyethylene

Exploratory work is being conducted to determine the utility of CPE as a plasticizer for vinyl for use in high temperature wire insulation. CPE's history has been as an impact modifier for rigid vinyl products. Use as a highly permanent plasticizer for vinyls has been known but is just beginning to be actively promoted by Dow.

E. B. Harris

Flexol 63

(1) Approval and orders for this plasticizer at Carol Wire Company have been received. The plasticizer was believed to be a deterrent to the battery cable stripping operation, but, this was found not to be so.

(2) Oil aging data on FLEXOL 63 is being measured to determine its capabilities for use in oil resistant 60° insulation.

E. B. Harris

THW Wire - 10-10/EPO Blends

A brief study is underway to learn more about possible water sensitivity of 10-10/EPO blends for use in THW wire. It was the intent to use Taft EPO (W) but because of plant start-up uncertainties, Institute EPO (W) is being used. A cursory check on Taft production will be performed when that facility is on-stream.

E. B. Harris

FLEXOL R3M (Modified)

Lauric acid and urea-treated 2-ethylhexanoic acid terminated R3M polymeric plasticizers were compared to the original R3M (untreated 2-ethylhexanoic acid cap) and Santicizer 409 for high speed mill heat stability. The lauric capped plasticizer provided heat stability in a Ba-Cd-Zn stabilized compound equivalent to S-409. In lead stabilized compounds, the lauric terminated R3M was not as good as S-409 but a satisfactory improvement over the original R3M.

A cursory check on the effect of the capping agent interchange on the processing and end-properties of a vinyl compound containing these plasticizers will be performed.

E. B. Harris

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042310

Plasticizers and Dry Blend Resin For Wire & Cable
Tarrytown (W. H. Bauer)
July, 1967

13.

n-Phthalates

The third phase of the evaluation of n-alkyl phthalates (C_6-C_{12}) has been delayed due to equipment difficulties. This phase covers mixed alcohol phthalates directed toward determining the variability in end-use properties of the plasticizer as a function of the n-alkanol feed stream.

E. B. Harris

Poly - ϵ -Caprolactone

A high molecular weight solid polymer of ϵ -caprolactone is being evaluated as a plasticizer for PVC. This polymer is a relatively efficient plasticizer with good initial low temperature impact resistance, and of course, good permanence. It suffers from limited compatibility and possibly heat and light instability. In general, this material shows promise and work designed to explore its potential in vinyl applications will continue.

E. B. Harris

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042311

PVC Compounds For Wire And Cable
Bound Brook (F. A. DeMelio)
July, 1967

14.

Porosity, QFD-9252

We have regained our sales of QFD-9252 Bk 9975 at Phelps Dodge on the basis of successful evaluation of 10,000 lbs. pilot plant production shipped in polyethylene lined gaylords. Previous porosity problems were related to moisture pick-up in shipments made with unlined gaylords.

H. J. Pazinski

QFY-9219 - Prestolite

Eltra reported that QFY-9219 (their own formulation) extrudes slower than a competitive compound they purchase from Firestone (Exon-5500). A sample of the competitive compound is being evaluated. We will then recommend a formulation to regain this business at Eltra (50,000 lbs. /month).

H. J. Pazinski

Adhesives

The use of Dr. S.W. Chow's ionic interpolymer as an adhesion promoter of vinyl compound to copper wire has been demonstrated. The interpolymer was continuously applied in-line to preheated copper wire before the wire entered the crosshead of the extruder. Subsequent coating with PVC compound yields a construction in which the PVC was adhered to the copper wire. The level of adhesion was outstanding (as evidenced by the high stripping force needed to remove the insulation from the wire. Work is currently underway to determine the effect of this polymer alloy when it is directly added to the compound.

E. J. Fisher

Visitors

<u>Date</u>	<u>Visitor</u>	<u>Host</u>	<u>Subject</u>
7/5	Society of Polymer Science (Japanese)	H. J. Pazinski	PVC Extrusion
7/19	Wire & Cable Trainees	H. J. Pazinski	PVC Compounds

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042312

Cellular Polysulfone

Our initial attempt to produce a cellular polysulfone was unsuccessful. Several gas producing chemicals and unstable polymers were used, but all were unsuitable because of non-uniform cell formation and poor surface appearance. We will make our next trial using nucleating agents in an attempt to gain cell uniformity.

J.J. Helbling

Modified Polysulfone

We are awaiting samples of the PSF-silicone block copolymer to be used as an additive in polysulfone wire insulation. This block copolymer, which has shown much promise as an impact modifier for molded items, will be given a complete evaluation as a wire coating additive.

J.J. Helbling

Reinforcing materials will be added to polysulfone in an attempt to improve stress crazing resistance. The following studies are planned:

1. Blending natural polysulfone with commercial glass filled polysulfone (LNP) to note the effect of glass concentration
2. Noting the effects of glass fiber L/D ratio and sizing composition
3. Introducing fillers other than glass such as asbestos.

R.R. Porcelli

Electrical Tests of Polysulfone Films At 60 Cycles/Sec.

Dissipation factor tests at 60 cycles/sec. have been performed on a series of polysulfone film samples. The first six films in the series were nominally 0.005" thick, while the last film sample was nominally 0.003" in thickness. The electrical tests were made at room temperature and at 100°C, with a few at 60°C. There was very little difference in dissipation factor between the room temperature and 100°C values. Both mercury and silver paint (DuPont #4817) electrodes were used, the latter being preferred, and no significant differences between the two types of electrodes were observed.

Polysulfone For Wire And Cable
Bound Brook (A.A. D'Onofrio)
July, 1967

16.

Exposure of some of the specimens to 90-98% relative humidity for 48 hours appeared to have little effect on the 60-cycle dissipation factors. The same conclusion was reached with regard to the effect of vacuum drying both at 190°C (for 20 minutes) and at 125°C (for 65 hours).

No dissipation factors greater than about 0.001 were observed through the temperature range from room temperature to 100°C.

There was a relatively large incidence of "shorts" in the case of the 0.003" film we tested with painted silver electrodes, viz., about two out of five. These were either due to small pin-holes (or air bubbles) or to dirt inclusions. No shorted specimens were encountered in the case of the 0.005" films (8597-31-1 through 6).

T. Hazen

Visitors

<u>Date</u>	<u>Visitor</u>	<u>Host</u>	<u>Subject</u>
7/25	Western Electric	J.J. Helbling	Polysulfone Extrusion
7/18	Sales trainees	J.J. Helbling	Telephone Singles

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Distribution - July, 1967
Monthly Technical Report
Wire And Cable Materials

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Mr. D. B. Braun
Mr. M. L. Dunham
Mr. P. K. Huester
Mr. T. C. Williams

POINT-AUX-TREMBLES

Mr. G. L. Bata
Mr. J. F. Boire

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