

MONSANTO CHEMICAL COMPANY
Plastics Division

MASTER COPY

Limited Procedure for Process Modification

TO BE RETAINED IN
STANDARDS DEPT. FILES

Requested by ... Leo Vartanian

Number ... E. 88-52

Technical Supervision
and Reporting By ... Leo Vartanian

Plant ... Springfield

Product Group ... Vinyl

Plant Dept. No ... 88

Limited to: Amt. of Material 12 batches

or Expiration Date

Modification of SDP ... Opalon X-70

Reason for Requested Variation

Allow scale-up studies of improved Opalon X-70 process (better initial color, propensity and more desirable particle size distribution) as modified through the use of Arlacel 20 (sorbitan monolaurate) and more complete kettle purging (vacuum boil), and to provide material for field evaluation-provided the product quality meets tentative specifications. This scale-up is a continuation of previous work carried-out in 92 Bldg. under limited procedure P92-59 and will be carried out in the experimental line under agitation and effle conditions identical to 92 Bldg. The work will lead to plant demonstration under E-41.

Details of Modified Procedure

	Date	Approval
P.T.S. Supv. Eng.	7/25	R. A. Coffey
Research Grp. Lead.	7/14	R. Pollard, K. Landi
Oper. Supt.	7/26	R. Perry
*Gen. Mfg. Supt.	7/27	W. Willis
*P.T.S. Manager	7/28	R. Dunlap
Standards Dept.	8/9	A. Ericksberg/is
M.T.S. Manager	7/15	C. E. Hamlin

*Approval required when segregation of expense is specified.

SEE ATTACHED

ISSUED AUG 9 1960
STANDARDS DEPARTMENT

BY *A. A. Ericksberg*

Reference to Previous Work

1. Pilot Plant Process for Opalon X-70, April 20, 1960, L. Vartanian, L. Rademache
2. Minutes of Pre-Startup Meeting, Opalon X-70 P-Number, May, 1960-L. Vartanian
3. Limited Procedure for Opalon X-70, P-92-59, May 9, 1960-L. Vartanian.
4. Statis Report - Opalon X-70 Development and Scale-Up, July 12, 1960-L. Vartanian

RSV0026416

Safety Hazards and Precautions (Including Toxicity, Air, and Steam Pollution)

None

Product Testing Required and by Whom Control Lab - Screen analysis, Reed and Bulk Density, heat stability, Robbins color, specific viscosity, loss in weight, contamination

Identification and Disposition of Material

Segregation of Product
Labeling of Product
Approval for Shipment

Costs

A. Estimated effect on manufacturing costs, if successful

B. Estimated extra manufacturing cost of this experiment

C. Segregation of Costs (by Operating Superintendent)

☐ No segregation of Costs required
☐ Special Accounting number will be required

D. If costs are segregated, accounting number assigned (by P.T.S. Manager)

Informational Copies to: (To be filled out by Standards Department)

Plant Laboratory Supervisor
Planning and Control Supt.
Marketing Technical Service Mgr.
General Mfg. Supt.
P. T. S. Manager
Accounting Dept.
Product Administrator
Research Section Leader
Overseas Mfg. Dept.
Other Domestic Plants

Foreign Plants

Other

MONSANTO CHEMICAL COMPANY
Plastics Division
Limited Procedure for Process Modification

Requested by

Number ...P.....

Technical Supervision
and Reporting By

Plant

Product Group

Date Approval

Plant Dept. No

Limited to: Amt. of Material

or Expiration Date

Modification of SDP

Reason for Requested Variation

P.T.S. Supv. Eng.		
Research Grp. Lead.		
Oper. Supt.		
*Gen. Mfg. Supt.		
*P.T.S. Manager		
Standards Dept.		

*Approval required when segregation
of expense is specified.

Details of Modified ProcedureReference to Previous Work

Safety Hazards and Precautions (Including Toxicity, Air, and Steam Pollution)

None

Product Testing Required and by Whom Control Lab: Screen analysis, Reed and K.M. dry time, bulk density, heat stability, Robbins color, specific viscosity, loss in weight, contamination. Research: Porosimeter, microscopic examination, Robbins formulation heat stability and color. MTS: Day blender.

Identification and Disposition of Material

Segregation of Product	Keep segregated
Labeling of Product	Lot number only on bags. Put X-70 and Prod. Code
Approval for Shipment	Research, MTS. 890.32 on ticket.

Costs

A. Estimated effect on manufacturing costs, if successful

Opalon X-70 = 12.6¢/lb. versus 12/9¢ Lb. for Opalon 300 and
12.3¢/lb. for Opalon 306

B. Estimated extra manufacturing cost of this experiment

Kettle Downtime	- \$1080	(36 hours @ \$30 per hour)
Extra Testing	- 900	(Control Lab Tests listed above)
Off Grade	- 1300	(Possibility of one batch of +40-20 mesh)
PTS Manpower	- 1000	(1 man month) material at C grade price
Minor Equipment Revisions	- 300	TOTAL = \$4580

C. Segregation of Costs (by Operating Superintendent)

☐ No segregation of Costs required
☒ Special Accounting number will be required

D. If costs are segregated, accounting number assigned (by P.T.S.

Manager) 890.32 Previously assigned. authorized production and excess
costs should be increased by amounts on this P No

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General Mfg. Supt.
P. T. S. Manager
Accounting Dept.
Product Administrator
Research Section Leader
Overseas Mfg. Dept.
Other Domestic Plants*

L. E. Louraine
J. D. Hitchen
C. E. Hamlin
W. P. Willis
R. I. Dunlap
J. Crabtree - P. Pastuszak
R. T. Clark
O. P. Cohen
H. E. Armstrong
J. Shriver - Oper. Supv.

Foreign Plants

Other

CEDETAILS OF MODIFIED PROCEDURE

The Opalon X-70 process, which is covered in detail in Ref. 1, consists briefly of the following operations:

<u>A. Formulation:</u>	<u>Parts</u>	<u>Weight</u>
Water	P150	16500 lbs.
VCM	100	11000 lbs.
*Methocel 90 HG., 100 cp.	0.03-0.10	3.3-11.0 lbs.
**Arlacel 20	0.10-0.20	11.0-22.0 lbs.
L2O2	0.15	16.5 lbs.
TCE	0.40	44.0 lbs.

* Suspending agent concentration to be studied.

** Modifier concentration to be studied.

B. Reaction Temperature: 59°C

C. Final Vent: Start at 50 psig or 45 minutes after pressure drops below 100 psig. During the experiment, Methocel concentration (0.03 to 0.10) and agitative intensity (4-12) will be varied to relate the effect of these variables on resin particle size, particle size distribution, porosity and initial color. Arlacel 20 concentration (0.10-0.20) and vacuum boil duration will also be varied to determine effects on resin properties. The correlation will be compared to the pilot plant data to optimize operation conditions and determine scale-up factors.

Run 1. A.I. - 6.4, Methocel conc. -.05, Arlacel 20 conc. 0.10, Maximum vacuum (Boil) Hold for 20 min.

Run 2. Same as Run 1, except Arlacel 20 conc. - 0.20.

Run 3. A.I. - 6.4, Methocel 0.05, Arlacel 20 (to be specified) Maximum Vacuum (Boil) Hold for 10 min.

Run 4.

to Study of methocel conc. and A.I. based on data from

Run 8. Runs 1, 2 & 3.

Run 9. As needed to obtain necessary scale-up data or produce to resin for field evaluation - provided product quality meets

Run 12. tentative specifications

Dodecyl alcohol will be used to prevent foaming, should it occur during the vacuum reflux.

Responsibility for determining conditions after Run #1 will rest with L. Vartanian and A. Torrenzano.

II. Quality, Rate and Yield Objections

A. Tentative Product Specifications (References 2 and 3)

B. Rate 5.6 M lbs. per year per 3700 gallon kettle based on -
(1) 10.0 hour cycle time (shorter cycle than P92-59 due to
(2) 10,000 lb. batch size. vacuum boil)
(3) 12.5 hour turn around time
(4) 80% operating efficiency.

C. Yield (Reference 3)