



THE DOW CHEMICAL COMPANY

P. O. BOX: 625

MIDLAND, MICHIGAN 48641

September 7, 1966

Boyer
517-ME6-1401

Joseph J. Kelly, Esq.
Johns-Manville
Research Center
Manville, New Jersey 08835



Dear Mr. Kelly:

Mr. J. W. Mighton of our economic evaluation group with the technical assistance of Dr. Harmer has worked out two cases for the economic evaluation of irradiated PVC Styrene Pipe. Three copies of this study are enclosed.

The basic assumptions are numbers 1 through 10 at the top of the page and the case for 9% and 27% Styrene is calculated through. We were rather pleasantly surprised to find that both cases actually show a dollar savings without assuming any increase in the rate of extrusion.

After thinking for some time about how to describe this fairly complicated economic evaluation exercise to you, I concluded that it would be best if one of your people familiar with such calculations could talk to Mr. Mighton on the telephone. His number is: (517) ME6-4505.

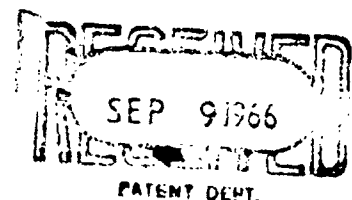
Sincerely,

Ray Boyer

R. F. Boyer
Director of Plastics Research

RFB/bp
encl.

cc: J. W. Mighton
D. E. Harmer
N. J. Rudy



MTC 017262

PRELIMINARY ECONOMICS
PVC/STYRENE IRRADIATED PIPE

BASES:

1. ASSUME 3" I.D. SCHED. 40 PIPE, 50% NSF GRADE, 50% OTHER		
2. TWO LEVELS STYRENE:	9%	27%
3. WEIGHT #/FT.	1.34	1.26
4. CAPACITY #/YR.	5 MM	4.67 MM
FT./YR.	3.7 MM	3.7 MM
5. DOSE REQUIRED, MEGARADS	0.3	1.2
6. CESIUM SOURCE ¹ REQ'D, CURIES	157,000	592,000
COBALT SOURCE REQ'D, CURIES	42,000	157,000
7. AM'T. EXPOSED ² , #/HR.	718	675
8. STABILIZER LEVEL ³ , AVE. PHR	1.8	1.0
9. RESIN SAVINGS BASED ON PVC @ \$.135/# & STYRENE @ \$.09/#		
10. EXTRUSION RATE ASSUMED SAME AS REGULAR PIPE (SHD ACTUALLY INCREASE).		

COSTS:

	9%		27%	
	CESIUM	COBALT	CESIUM	COBALT
RAW MAT'L. SAVINGS, PVC	\$+.0020/#	\$+.0020/#	\$+.0089/#	\$+.0089/#
STAB.	+.0132	+.0132	+.0196	+.0196
LABOR, \$7850/YR.	-.0015	-.0015	-.0016	-.0016
UTILITIES, \$3600/YR.	-.0007	-.0007	-.0007	-.0007
MAINT, DEPR., I & T, F.E.				
\$31,540/YR.	-.0063	-.0063	-.0067	-.0067
SOURCE ADDITION ⁴ & AMORT.	-.0005	-.0012	-.0012	-.0047
	\$+.0062/#	\$+.0055/#	\$+.0183/#	\$+.0148/#
SAVINGS PER YR.	\$31,000	\$27,500	\$85,400	\$69,070
CAPITAL: EQUIP.	\$77,000	\$77,000	\$77,000	\$77,000
RADIATION CAVE	71,000	71,000	71,000	71,000
SOURCE	39,000	30,300	148,000	92,600
ADD'N'L. WORKING CAP.,				
INVENTORIES	15,000	15,000	13,000	13,000
	\$202,000	\$193,300	\$309,000	\$253,600
RETURN ON INVESTMENT	15.3%	14.2%	27.6%	27.2%

¹CESIUM AVAILABLE IN 18 MOS.

²BUNDLES OF 20 FT. LONG PIPE IS CONVEYED VERTICALLY THROUGH CAVE @ 3.35 FT./HR.

³ASSUMING 50% PIPE PRODUCTS USE 2 PHR TIN STABILIZER @ \$2.25/# & 50% USE 5 PHR LEAD @ .25/# WITH REGULAR COMPOUNDS AND STYRENE COMPOUNDS REQUIRE 1/2 & 2/7 OF THIS AM'T. RESPECTIVELY

⁴APPROX. 1.75% OF CESIUM IS ADDED EACH YEAR (OR 7% EACH 4 YRS.) TO MAINTAIN CURIE LEVEL.

APPROX. 10% OF COBALT IS ADDED EACH YEAR TO MAINTAIN CURIE LEVEL.

JWM 082966

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