INTER-OFFICE MEMO **TENNECO CHEMICALS, INC.**

TO G.I. Rozand AT Piscataway DATE November 26, 1974

FROM W.C. Champion AT Burlington COPY TO W.A. Britton
H.B. Carr
W.F. Gabel
P. Gawason
F.W. Kanzler
F.X. Ritter
P.R. Scarito
File

SUBJECT VCM Monitoring - Compound Plant

Reference: (1) Memo, P. Gawason to W.C. Champion, "VCM Levels in Compound Air", November 19, 1974 (attached)

(2) Memo, F.W. Kanzler to W.F. Gabel, "Compound Plant - Determination of VCM Levels in Compounds and Air", October 28, 1974

The attached memo by Paul Gawason details our findings in a detailed VCM exposure survey of the Compound Plant over a ten-day period (October 30th through November 11th). During this time, compounds representative of our entire product mix were run, so this survey should provide information typical of normal operations.

From the data presented, the following conclusions may be drawn:

1. Compound Plant operations can be brought below the OSHA exposure "action limit" of 0.5 ppm VCM by simple improvements in ventilation or changes in work practices.

2. Under current operating conditions, the action limit is reached or occasionally exceeded, even where low residual monomer content (<50 ppm) resin is used, in the following locations:

   a. On the mixing platform, levels of 0.5 and 0.9 ppm were reached when resins containing 356 and 374 ppm VCM, respectively, were being blended. Lower residual monomer content resins would correct this.

   b. On the CM feeder deck, even when low (18 ppm) residual monomer resin was used. Local exhausting with a flexible hose would eliminate this emission source.

   c. At the CM outlet/pig conveyor, again even with low monomer content resin, extension of the mill or conveyor hood would correct this.

   d. In the bagger area. Two incidents occurred (1.0 and 0.5 ppm with 18 and 374 ppm resin, respectively). Local exhaust in this area may be required.

3. No readings equaled or exceeded the action limit in the panel board, laboratory, warehouse or color room areas.

4. The general operating floor VCM "background" was 0.1 - 0.3 ppm, as measured during runs where the dry blend being fed to the CM contained no detectable monomer.

5. Previous observations relative to VCM losses during compounding were confirmed:

   a. Principle monomer loss - 60% or more - occurs after plasticizer addition in the dry blend state.

   b. Little or no monomer loss occurs during production of record compound.

   c. No monomer was found in the belt cooling water.

W.C. Champion

Attachment.

WCC/jst

INTER-OFFICE MEMO **TENNECO CHEMICALS, INC.**

TO W.C. Champion AT Burlington DATE November 19, 1974

FROM P. Gawason AT Burlington COPY TO F.W. Kanzler
G.I. Rozand
P.R. Scarito
File

SUBJECT VCM Levels in Compound Air and Various PVC Compounds Burlington Compound Plant

The attached table lists the amount of VCM present in various PVC compounds and air samples in various work areas during the time period from 10/30/74 to 11/11/74. The data shows a $\bar{x}$ of 0.3 ppm VCM via pump air samples.

The compounds selected for testing were the large volume, flexible, unfilled, filled, semi-rigid and record compounds. Over this time period, approximately 2M lbs of compound was produced with the samples tested representing 1.5M lbs of compound or about 75%. One complete set of samples were taken from each lot number with the exception of 2901-1 Natural-01 where two complete sets of samples were taken per F.W. Kanzler's memo dated 10/28/74 (Compound Plant VCM Levels).

From this data, it is obvious that additional samples and test conditions are required before 100% compliance to the OSHA specification is attained.

Listed below are various parameters required to establish a detailed program on VCM levels at the Compound Plant. These variables should be measured on each compound run, if possible:

1. the rpm of each blender should be checked to determine if this is constant
2. recording of temperature of resin added to blenders
3. recording of steam pressure on blenders
4. recording of plasticizer temperatures
5. recording of Quality Control Laboratory dry blend sample temperatures
6. recording of dry blend drop temperatures
7. recording of CM dry blend feed temperatures
8. recording of CM pig stock temperatures
9. recording of mill material temperatures
10. recording of pellet temperature in bags
11. recording of total cycle time in blenders
12. the effect of carbon black on record compound compared to a black, flexible compound.

Due to the various schedule changes at present, no additional testing is presently planned.

Please advise future work or analysis required on future runs of PVC compounds.

P. Gawason

P. Gawason

Attachment.

PG/jst

E I

Date	10/30/74	10/31/74	11/1/74	11/4/74	11/5/74
Compound	2022 Gray 148	2820 (2825) Natural	2800 Natural	3086 Clear 22	3098 Clear
Lot Number	8-104317	8-104318	8-104319	8-114328	8-114329
1. Air Samples (PMP)					
a. mixing platform; VCM, ppm	0.2	0.2	0.3	0.3	0.5
b. feeder deck; VCM, ppm	0.2	0.1	0.2	0.3	6.7
c. between CM & panel bd; VCM, ppm	0.2	0.2	0.2	0.2	0.2
d. pig conveyor; VCM, ppm	0.2	0.1	0.7	0.8	0.1
e. mill area; VCM, ppm	0.1	0.1	0.6	0.3	0.3
f. bagger area; VCM, ppm	0.1	0.1	1.0	0.1	0.1
g. laboratory - mill area; VCM, ppm	0.1	0.1	0.4	0.3	ND
h. warehouse - storage area; VCM, ppm	0.1	0.2	0.2	0.3	0.2
i. color room; VCM, ppm	0.2	0.3	0.3	0.3	ND
2. Resin and Compound Samples					
a. resin as charged to blender; VCM, ppm	ND	24	18	33	356
b. dry blend - after raw mat'ls added; VCM, ppm	ND	4	6.4	10	65
c. dry blend - before drop; VCM, ppm	ND	ND	4.4	5.1	34
d. belt feeder to CM; VCM, ppm	ND	ND	3.2	5.6	26
e. CM pig; VCM, ppm	ND	ND	2.1	5.4	11
f. mill slab; VCM, ppm	ND	ND	2.7	4.7	13
g. pellets; VCM, ppm	ND	ND	1.8	2.7	13
h. ribbon cooling water; VCM, ppm	ND	ND	ND	ND	ND
Type of Resin Used	250-12S	Reposa	Reposa	Portugese	Flemington 225
Lot Number	394025	-	-	-	ACFX 96313
Time in Blender After Charge Compl.; minutes	55	55	50	35	30
Plasticizer					
a. type	Nuoplaz 6187	Nuoplaz 6908 DUP	Nuoplaz 6908	Santicizer 790 Nuoplaz 849 Santicizer 711	Santicizer 690 Nuoplaz 849
b. phr	59	28 22	53	38 4 3	20 5
c. phr of Camelwhite in resin sample	-	10	15	-	-
d. type of stabilizer	basic lead silicate sulfate organic complex	tribasic lead sulfate organic complex	basic lead silicate sulfate organic complex	barium cadmium zinc complex	monobutyl tin

TABLE I – 2

Date	11/7/74	11/8/74	11/8/74	11/11/74
Compound	2901-1 Natural 01	2901-1 Natural 01	2700 White	3805-D Black
Lot Number	8-114332	8-114332	8-114331	8-114339
1. Air Samples (PMP)				
a. mixing platform; VCM, ppm	0.1	0.8	0.1	0.1
b. feeder deck; VCM, ppm	0.2	0.2	0.1	0.1
c. between CM & panel bd; VCM, ppm	0.1	0.2	0.1	0.3
d. pig conveyor; VCM, ppm	ND	0.2	0.3	0.9
e. mill area; VCM, ppm	0.2	0.4	0.1	0.1
f. bagger area; VCM, ppm	0.1	0.5	0.1	0.1
g. laboratory - mill area; VCM, ppm	ND	0.1	0.1	0.1
h. warehouse - storage area; VCM, ppm	0.1	ND	0.2	0.1
i. color room; VCM, ppm	0.1	0.2	0.2	ND
2. Resin and Compound Samples				
a. resin as charged to blender; VCM ppm	134	374	58	218
b. dry blend - after raw mat'ls added; VCM, ppm	7.3	3.2	7.6	190
c. dry blend - before drop; VCM, ppm	0.3	0.7	ND	180
d. belt feeder to CM; VCM, ppm	0.3	0.6	ND	184
e. CM pig; VCM, ppm	0.3	0.6	ND	211
f. mill slab; VCM, ppm	0.3	0.4	ND	218
g. pellets; VCM, ppm	ND	0.3	ND	229
h. ribbon cooling water; VCM, ppm	ND	ND	ND	ND
Type of Resin Used	225/16R	F-9300	Reposa	315
Lot Number	234078	Bin 32	-	614043
Time in Blender After Charge Compl.; minutes	50	55	65	55
Plasticizer				
a. type	Nuoplaz 6908	Nuoplaz 6908	Nuoplaz 6055	-
	TOTM	TOTM	Nuoplaz 6908	
b. phr	6.5	6.5	13.5	-
	53.5	53.5	50	
c. phr of Camelwhite in resin sample	15	15	14	-
d. type of stabilizer	basic lead chloro silicate organic complex	basic lead chloro silicate organic complex	basic lead silicate sulfate organic complex	tribasic lead sulfate/ dibasic lead stearate

F.W. Kanzler
11/14/74

DRAFT SUMMARY

QUALITY CONTROL MONITORING AND RECORD KEEPING PROCEDURES

Current	After January 1, 1975	After Computing System
A. Personal Monitoring Using personal monitoring pump (Sipin-type), 45-50 ml/min flow rate, charcoal absorption tube, monitor according to Procedure TAM 1-9: 1. Target all polymerization operating personnel, once per week, others once per month. 2. Actual 75% of personnel once per week (or month). 3. Sample at specific jobs, 10-15 minutes. 4. Analyze samples in accordance with Method GCF - 2.0. 5. Report: a. Weekly exposure summaries by shift, by person - to Works Manager, G.I. Rozand, W.C. Champion. b. Weekly summaries by job classification to Works Manager, J.F. Kilcullen, G.I. Rozand, W.C. Champion. c. Files maintained by Quality Control, Works Manager.	A. Personal Monitoring Change from current as noted: 1. Target all polymerization operating personnel twice per month, others once per month. 2. Actual 75% twice per month (on once-per-month). 5. Report: a. Bi-monthly exposure summaries by shift, by person - Works Manager, G.I. Rozand, W.C. Champion. b. Bi-monthly summaries by job classification to Works Manager, J.F. Kilcullen, G.I. Rozand, W.C. Champion.	A. Personal Monitoring Change from January, 1975 as noted: 1. Target all personnel once per month. 2. Actual 75% once per month.

Current	After January 1, 1975	After Computing System
d. Separate file for each person maintained by Works Manager. 6. Personnel whose monitoring samples exceed limit (50 ppm) advised verbally by foreman.	6. Advise personnel of exposures 1 ppm in writing.	7. Stored coded exposure information (by classification, by individual) on magnetic tape for later retrieval.
B. OVA Area Monitoring Using Century OVA, monitor levels of VCM in air according to Procedure TAM 1-10: 1. Monitor daily (5 days per week). 2. Report results to Works Manager, G.I. Rozand. 6. Separate report of reading exceeding standard (>50 ppm) to Works Manager, G.I. rozand, W.C. Champion. 7. Files maintained by Works Manager. 8. Monthly averages used to compute estimated time-weighted exposure averages (TWA) for each job classification. Results reported to Management; files maintained by Quality Control.	B. OVA Area Monitoring Change from current as noted: 6. Delete. 8. Delete.	B. OVA Area Monitoring Century OVA to be employed mainly for leak detection in support of fixed monitoring system. Routine surveys of areas not covered by fixed system (outside areas) only.
C. Bendix Fixed Monitoring Not currently operable.	C. Bendix Fixed Monitoring Quality Control will operate, calibrate	C. Bendix Fixed Monitoring Change from January, 1975 as noted.

Current	After January 1, 1975	After Computing System
	and maintain the fixed monitoring system in accordance with Procedure _____:	
	1. All areas to be monitored continuously.	
	2. Calibration and operational checks once per day (7 days/week).	2. Calibration and operational checks daily by computer.
	3. Tabulations of the readings for each point will be made once per day. Monthly averages will be used to estimate time-weighted exposure averages (TWA) for each job classification.	3. Tabulations of the range and average for each point will be computed once per shift. TWA's by job classification will be reported once per shift.
	4. Results will be reported to Management in form suitable for posting. Files will be maintained by Works Manager.	4. Results reported daily.
	5. Charts will be dated, signed and filed by Quality Control for 30 years.	5. Charts will be stored for one month.
	6. Reporting and investigation of excursions (>25 ppm) by Production personnel.	
		7. Computer will print out all excursions over pre-selected limits on a continuous (real-time) basis, for action and investigation by Production personnel.
		8. Monthly report of area averages and TWA's will be prepared for Managerment.
		9. All records will be stored on a monthly basis on magnetic tape, filed by Quality Control

W.C. Champio
11/26/74