Tenneco Chemicals
A Tenneco Company

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April 1, 1975

Mr. Sidney Gross
Editor-in-Chief
Modern Plastics
1221 Avenue of the Americas
New York, New York 10020

Dear Mr. Gross:

I read with great interest your editorial on VCM lessons in the March issue of Modern Plastics. I would like to offer my comments for you and your readers' consideration.

As a PVC producer and vinyl processor, we quite agree with you that comment on the subject of VCM is timely and that there are a number of lessons to be learned, not only for the plastics industry, but also more generically for the chemical industry as a whole. My own views of these lessons, however, differ with yours, and I would like to amplify on this divergence of opinion.

It must be clearly understood not only by those of us who have been involved in the VCM problem for over a year, but also by the media and the public at large, that the OSHA standard published as of October 1 differs very significantly from the proposed permanent standard to which the industry was responsive in comments at the OSHA hearings in Washington last June and July. These cardinal differences are as follows:

The proposed permanent standard advocated a VCM level in all VCM, PVC and processing plants at a non-detectable level in contradistinction to the final standard level of 1 part per million on a time weighted average basis and a maximum of 5 parts per million prior to the mandatory use of respirators. Second, at the time of the industry's response, the use of respirators of the type now allowed in the final standard had not been considered. Third, the originally proposed standards set a non-detectable level as an absolute and immediate value. The final standard, however, sets the levels of 1 TWA-5 ppm as targets to be achieved by a combination of respirators and engineering improvements. It permits the use of respirators to the extent to which engineering practices cannot approach these levels.

Perhaps these differences are somewhat subtle and technical to those not directly facing the task of compliance with the regulations. We remain convinced that, if faced with compliance of the standard to which it responded last summer, the vinyl industry would find the same lack of technical feasibility today to which it testified at that time. Thus, I cannot concur that our position was merely a tactical stance or that our credibility has been impaired since we are today attempting to comply with a standard clearly and materially different from that on which we testified last summer. It must also be understood that compliance with the final and most stringent levels of the standard is now one year away, and it is unlikely that manufacturers would voluntarily shut down their facilities prior to the time they can no longer meet it. Thus, it is yet unknown which if any segment of the industry will have to shut down beginning April 1976, what grades of resin can be produced at that time, and which will have to be dropped. It is also not known at this time what restrictions on capacity will result from these regulations nor what the effect on the marketplace will be of the cancer suspect label on PVC resin containers to which the industry objected so strenuously. In view of the magnitude and seriousness of the problem, I believe that immense progress has been made during this past year and that the reactivity of PVC-VCM producers as a group has been commendable.

As a leading PVC producer and a responsible member of the chemical industry, we at Tenneco are dedicated to take the problem out of the hands of the plastic processors, our customers. We consider the key to this step to be the removal of VCM to minimum or, eventually, non-detectable levels within the PVC resin itself so that the processors' plants will be assured of being below the OSHA defined "action" level of 0.5 ppm. It is important that all concerned with the manufacture and use of polyvinyl chloride thoroughly understand that this polymer--in contrast to the monomer from which it is produced--is a safe, useful and harmless product of immense versatility representing perhaps the most important family of thermoplastic polymers within the plastics industry.

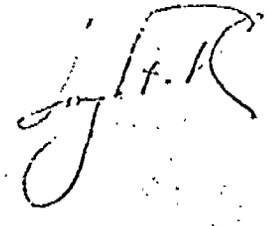
As a member of the chemical industry, we at Tenneco are dedicated to applying our expertise and fulfilling our traditional role in converting useful yet hazardous chemical building blocks and upgrading them to consumer products beneficial to our society and vital to the betterment of the standard and quality of our lives. Now that we are aware of the implied hazard in handling VCM, we can modify and improve our technology so that its conversion to non-hazardous PVC polymer is conducted with the same degree of safety by which we convert toxic carbon monoxide to useful polyurethanes or toxic hydrogen cyanide to valuable acrylic polymers.

We at Tenneco are further dedicated to producing PVC on the best and most advanced technological basis, thereby contributing to its continued growth. It is our policy to operate our plants in compliance with government regulations and consistent with a safe working environment for our employees and the communities in which they are located.

Working with the various government regulatory agencies over the past year, we have detected a mutual learning process by all parties concerned, that is beginning to evolve into a valuable cooperative effort toward the solution of environmental problems. I firmly believe that the key to future problem solving is for all interested parties to abandon their traditional adversary positions and to define common rather than special interests within the problem parameters, of all interested parties—government, industry, labor, the medical profession and the news media.

Of these, the media can be of greatest service to all concerned. While I can fully appreciate the great difficulty in translating technical subtleties to a large readership in an orderly, concise and clearly understood manner which at the same time remains in the context intended, the media's impact is sufficiently great that they must accept their responsibilities through accurate, constructive, unbiased, and emotionless portrayals of the issues involved. Toward that end, we at Tenneco stand prepared to assist in any clarification necessary to convey the facts of the case and the status of the problem.

Sincerely yours,



JF:ts

bcc: Messrs. F. Buff
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Editorial

VCM lessons

An informal survey among PVC producers following the Appellate Court's ruling upholding the OSHA standard on VCM (see p. 14) uncovered no rush to shut down the vinyl industry. Of course, no one was jumping with joy either; and no one was belittling the tasks now faced by the industry in meeting the standard. But the dire predictions of an end to the U.S. vinyl industry certainly seem to have fizzled.

Yet such predictions were made—and buttressed with extensive statistics of massive job losses—at various stages of the discussions leading up to the final standard. And the impression they left was that if OSHA prevailed, PVC was doomed.

As it turns out, no such thing is going to happen. There are ways, apparently, of meeting the challenge. They may be expensive, but they seem manageable.

Why, then, did the vinyl industry take its "we can't survive" position? One must assume that it was a tactical stance. But such a stance carries grave risks . . . on two counts.

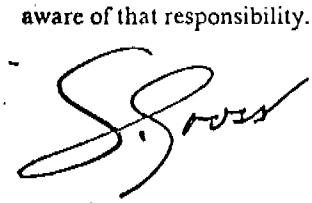
First, it scares the users. Faced with the possibility that his supplies will disappear, the traditional vinyl user will start scrambling for substitute materials or for overseas sources . . . both damaging to the domestic vinyl industry. What, for example, is an automotive producer going to do? He is committed to an average of about 30 lb. per car. He must protect himself.

Second, it destroys the industry's credibility; and that will cost dearly in its future dealings with regulatory agencies . . . and, of course, in its dealings with customers too.

The damage is done this time. But perhaps we've learned our lesson so it won't happen next time.

Another lesson, this one to be learned by the government, is the need to be more conscientious in defining exactly what the issue is. The popular press, picking up catch phrases here and buzz words there, tends to sensationalize its reporting on public issues. And before you know it there are people worrying about handling telephone wire, baby pants, nursing bottles, packaging film, and whatnot.

Government agencies have the responsibility of assuring that the health of the nation is guarded. But they also have the responsibility of seeing to it that in the process the nation's standard of living is not destroyed. In the VCM case, government officials have failed to assure the public of the safety of the products in common use. In the atmosphere of hysteria surrounding VCM, such assurance was clearly called for. Clarification of the issues may not produce the headlines a cancer scare will, but it is essential nevertheless to keep the population on an even keel. We have to make sure that in future issues of this type the government is aware of that responsibility.



TENNECO INTERMEDIATES DIVISION
PASADENA PLA
STANDARD ANALYTICAL PROCEDURES

NO. 56-6-
DATE 1-[illegible]
APPROVED [illegible]

TITLE

DETERMINATION OF VCM IN PVC RESIN

Analysis Required:

Vinyl chloride monomer (VCM) in polyvinyl chloride (PVC) resin samples is determined. The method is applicable to both homo and copolymer samples in addition to compounded samples which do not contain high boiling plasticizers or volatile components which may elute near the VCM peak.

Theory:

The solid resin sample is dissolved in tetrahydrofuran and the solution injected into the gas chromatograph. The peak height of the vinyl chloride monomer is compared with that of a VCM standard in order to obtain the level of VCM in the resin as parts per million by weight.

Equipment:

Gas chromatograph, Varian Model 1800 or equivalent, equipped with hydrogen flame ionization detector, gas sampling valve and liquid injection port.

Potentiometric Recorder, 1.0 millivolt full-scale response.

Column, 1/4" x 5 feet stainless steel packed with 20% Octol S on chromosorb P, 30-60 mesh, aqua regia washed.

Syringe, 10 microliter capacity, Hamilton No. 701-N or equivalent.

Pipette, volumetric 100 ml capacity.

Erlenmeyer flask, 125 ml capacity, with ground glass stopper or screw cap.

Magnetic stirring bar.

Stirring plate.

Reagents:

VCM standard gas, 1-10 ppm by volume

Tetrahydrofuran, chromatoquality. (THF)

Chromatograph Operating Conditions:

Sample Size: 5.0 microliters for liquid samples and 1.0 milliliter for gas standard.

Carrier Gas: 60 ml/min.

Hydrogen: 30 ml/min.

Air: 300 ml/min.

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PASADENA PLANT
STANDARD ANALYTICAL PROCEDURES

NO 56-6-3
DATE 1-16-75
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TITLE

DETERMINATION OF VCM IN PVC RESIN

Temperature: Column-50°C

Procedure:

1. Standardization:

   Inject the gas standard into the chromatograph, using a sample valve which delivers a known volume of approximately 1. ml. Measure the height of the VCM peak.

2. Analysis of resin samples:

   a. Weigh to the nearest .1 mg. approximately 4 g. of the resin into a 125 ml. Erlenmeyer flask. Pipette in 100 ml. THF, and stir on a magnetic stirring plate until completely dissolved. Do not allow the solution to exceed room temperature.

   b. Inject exactly 5.0 microliters into the gas chromatograph and run at the above conditions. Measure the height of the VCM peak.

Calculations:

ppm by weight of VCM in resin =

$$\frac{\text{spl. pk. ht.}}{\text{std. pk. ht.}} \times \frac{\text{ml. of spl. soln.}}{\text{gm of PVC}} \times \text{std. ppm by vol.} \times \frac{\text{ml. of std.}}{\text{ml. of sx.}} \times \frac{62.5}{24{,}400}$$

Substituting the values of the present equipment and standards, the right side of the equation becomes

$$\frac{\text{Spl. pk. ht.}}{\text{std. pk. ht.}} \times \frac{104.4}{4.} \times 1.1 \times \frac{1.07}{.005} \times \frac{62.5}{24{,}400}$$

or

$$\frac{\text{spl. pk. ht.}}{\text{std. pk. ht.}} \times 15.7$$

NOTE: The final 15.7 factor is valid only for the conditions as shown.

Notes and Precautions:

1. Caution: VCM is a highly flammable and toxic gas at room temperature. It forms explosive mixtures with air at vapor concentrations above 4%. All handling of VCM and solutions of VCM should be done in an explosion-proof hood posted with a warning against the use of flames and electrical

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TITLE

DETERMINATION OF VCM IN PVC RESIN

equipment. Avoid spills of VCM. Do not add VCM to solvent which has not been cooled with a dry ice in acetone bath. Leave hood on at all times when VCM or VCM in THF solutions are stored in hood.

2. The solid PVC resin is left in the injection port after the VCM and THF have volatilized. A buildup of resin in the injection port was found to have a detrimental effect on baseline stability. The injection port should be cleaned, or the liner changed twice per week during periods of constant operation to minimize this problem.

3. The instrument calibration must be rechecked daily when running this procedure. This can be accomplished by running one of the standards in duplicate at the start of each day and averaging the results.

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