

VINYL INSTITUTE TECHNICAL COMMITTEE

New Orleans Airport Hilton
901 Airline Highway
Kenner, Louisiana 70062

Tuesday
December 3, 1991
8:00a - 2:20p

Attendees:

Frank Borrelli, Georgia Gulf Corporation
Lawrence Brecker, Witco Corp./Argus Division
Lee Fishbein, Borden Chemicals & Plastics
Donald Goodman, OxyChem
Roy T. Gottesman, The Vinyl Institute
H. J. "Bud" Hall, Vista Chemical
Richard S. Magee, NJ Institute of Technology
Louis M. Maresca, BFGoodrich
Ron McCreedy, Dow Chemical, USA
Debbie Neale, BFGoodrich Company
Al Reventas, Shintech, Inc.
Robert S. Strength, Product Safety Management, Consultant to Vista

I. Opening of Meeting/Approval of Minutes of September 12, 1991 Meeting

Executive Director Roy Gottesman, opened the meeting at 8:00 a.m. and advised the group that because of changes at BFGoodrich, Dr. Charles Bush was no longer associated with the company and a new chairman will be needed for the Technical Committee. He advised that he plans to discuss this with the Executive Committee of the Institute at their meeting on December 11. He indicated that, with the approval of Vinyl Institute Chairman John Russ, he would chair this meeting and possibly the next meeting of the Technical Committee until a new chairman is named. There next followed a round of self introductions.

The minutes of the September 12, 1991 meeting were approved as received on motion of Bud Hall, seconded by Larry Brecker.

II. Objectives of Meeting

Roy Gottesman indicated that the objectives of this meeting were:

1. To review all existing projects including status, problems and funding.
2. To discuss new items for consideration as possible projects by the Committee.
3. To review the current budget status.
4. To consider items for next year's Technical Committee budget.
5. To agree upon a meeting date and place for the next Committee meeting.

III. Project Reviews

A. Fire Sciences

1. Combustion and Toxicology

An ASTM Task Force (E5.21) is scheduled to resolve the negative ballot on the NIBS protocol at a meeting in San Diego on December 9. Roy Gottesman distributed a reprint of an article from the Journal of Fire Sciences, September/October, 1991, entitled "A Critical Evaluation of the Proposed NIBS Toxicity Test" by Drs. Clarke and Hirschler. The critique was developed under VI sponsorship about two years ago. Mr. Hall indicated that he believes the prognosis of resolving the negative ballot is poor.

In behalf of the Vinyl Institute, Marcelo Hirschler voted negatively on ASTM-5.21 which is a modification of the NIST Test developed by Dr. Steve Packham. In voting negatively, Dr. Hirschler pointed out that this was due to a lack of a correction factor on carbon monoxide and the fact that no method for data evaluation was provided in the protocol. With these corrections, Bud Hall indicates that the Packham Test will likely be approved in the ASTM process.

Bud Hall reviewed the activity of a New York City Toxicity Advisory Council which appears to be favoring the adoption of the New York State (modified Alarie) protocol. However, he voiced concern over a proposal that has been introduced by the Carpet and Rug Institute which uses the concept of an area rather than a concentration, i.e., LA_{50} vs. LC_{50} . This proposal was developed in consultation with Rosalind Anderson and Dr. Alarie appeared at the last meeting of this committee in behalf of the Carpet and Rug Institute. While no decision has yet been made by New York City, SPI is considering offering a recommendation of its own for the testing protocol to be adopted by New York City. Dr. Frederick Clarke is the SPI representative on this Council.

2. Corrosion

The negative ballots that have been received on the NIBS test (E5.21.70) advocated by "Hank" Roux and the Cone Calorimeter test (D9.21.4) proposed by DuPont will be discussed at the ASTM meeting on December 9 in San Diego. Both of these tests are expected to pass. Bud Hall indicated his preference for the D9.21.4 test which he believes will become a standard test within two-three months. Further he voiced his opinion that the entire corrosion issue is one that is being driven by the plastics industry. He noted that he does not see a lot of demand from either customers or the public for such testing.

A test protocol for corrosion testing (see Appendix A) was discussed. This would involve a comparison of various PVC wire and cable compounds and competitive materials in a modified NIBS Cone Calorimeter and Cone Corrosiviter test program. The estimated total costs are approximately \$52,000 with the testing to be carried out at BFGoodrich Company. There were a number of questions regarding the costs including the requested fee of \$10,000 by Safety Engineering Laboratories (Dr. M. Hirschler) for program management, consultation, data assessment, and report preparation.

There was discussion on the probable outcome of this testing. There will be obtained data, currently not available, which will compare the performance of PVC versus other materials such as polyolefins and fluoropolymers. It was agreed that such information would be used to promote the best PVC wire and cable materials based on the data obtained but not for competitive materials "bashing".

Following discussion, the Committee agreed unanimously to carrying out this program at a cost not to exceed \$50,000. If this cost is in excess of \$50,000, Bud Hall will inform the Technical Committee. In agreeing upon this approach, the following assignments were made:

- a. Dr. Maresca will confirm the BFGoodrich costs.
- b. Mr. Hall will confirm the cost to be paid to Safety Engineering Laboratories including the basis for the \$10,000 management fee, negotiating if it appears realistic for a lower fee.
- c. Dr. Magee will review the experimental program, critique this and make any suggestions with regard to the experimental design.

Attention next shifted to a letter received from Carl Tripp of the Polyolefins Fire Performance Council dated October 15. In this letter, the Vinyl Institute was invited to join the latest round of testing to be carried out by the Polyolefins Fire Performance Council using the proposed D.9 protocol. After discussion, it was agreed that it is in the Vinyl Institute's best interest to join this effort and to have two samples evaluated in this program.

The following actions were agreed to:

- a. Roy Gottesman will advise Carl Tripp that The Vinyl Institute will join in this latest round and will submit two advanced performance vinyl materials.

- b. Lou Maresca will identify the best Flexel[®] material to be included in this program and will advise Roy Gottesman of same.
- c. Bud Hall will identify the best Plenex[®] material to be included in this program and will also advise Roy Gottesman.

In advising Carl Tripp of this decision, Roy will inquire as to the quantity of material needed and where it is to be shipped and will advise Lou Maresca and Bud Hall so that they can transmit samples.

3. Factory Mutual

Bud Hall indicated that he had contacted Archie Tewarson who had agreed to submit a protocol and the reason for Factory Mutual's wanting to carry out this evaluation in their calorimeter. As this has not been received, no samples have been submitted and no further action is planned unless Mr. Tewarson provides the protocol.

4. IEC - '89

Drafts of four corrosion tests (NIBS, ASTM D9.21, CNET, and DIN) and four toxicity tests (NIBS, NIST, DIN and a modified DIN test with no animals) are being prepared and will be submitted at a May, 1992 meeting of IEC '89 to be held in Ottawa. These drafts are expected to be completed by the end of this calendar year.

5. HCl Decay Modeling

This work still remains to be completed at Goodrich and it was requested the Dr. Maresca look into this situation.

Assignment

Lou Maresca will determine the estimated completion date and likely costs for completion of the work on the modeling of HCl Decay.

6. NFPA Fire Risk Assessment

Bud Hall indicated that he has some indication of a possible problem with this program. SPI was initially involved and over a three-year period contributed almost \$1,000,000. It appears that the program may be floundering at the present time and Lou Maresca will investigate this.

Assignment

Dr. Maresca is to check with Marcelo Hirschler and others intimately involved with this program at BFGoodrich to determine the status of the NFPA Fire Risk Assessment program.

7. NFPA/NEC

This code panel hearing in December will finalize the NEC proposals with a final vote scheduled for May, 1992. It is expected that some optional designations, vis. LS LHR will be accepted.

8. BOCA - Vinyl Siding Issue

Bud Hall indicated that due to the excellent work of Rich Gottwald of SPI, PVC siding has been reinstated in the BOCA code and a significant victory has been achieved.

B. Solvent Cement Issue (SCAQMD)

Don Goodman serves as vice-chairman of an ad hoc group established on the solvent cement issue as related to proposed regulations by the South Coast Air Quality Management District (SCAQMD). He indicated that the deadlines for compliance with new regulations which would require reduction of volatile organics from 850 grams/ltr. to 250 grams/ltr. by the end of 1992 appear to be real. He noted that matching funding to the initial grant of \$25,000 by the Vinyl Institute has spurred contributions from PPFA, individual manufacturers of solvents and some solvent cement manufacturers. However, contributions have not been forthcoming from either pipe manufacturers or fabricators.

As a result of recent meetings with SCAQMD in California, it appears that a participatory and cooperative effort to arrive at a realistic test protocol and standard is not likely to happen and that, in fact, an adversarial relationship is more likely to be the outcome.

Don Goodman described the FMC static test and indicated that a functional test has not yet been developed. The techniques used by FMC in the development of these tests are seriously flawed in Don's opinion.

He noted that approximately 10-20% of the solvent contained in the cement is lost upon application and that approximately 50% of the solvent is lost within two days. A significant change at SCAQMD has been their agreement that solvent is retained in the joint and this can amount to 30-60% of the solvent cement. Don further noted that cement suppliers are showing diligence in attempting to reduce the solvent levels in their products.

In the coming year, he indicated the technical program will involve studies around the material balance to determine where solvent emissions to the atmosphere occur. Included here would be attempts to design a container/applicator which would minimize air emissions. He also indicated that consultations would continue with SCAQMD on an applied test. Work to define alternative joining systems would also be involved.

In other areas, he proposed continuing to network within the industry, to coach SCAQMD on applications and to begin a communications/lobbying campaign.

With regard to next year, Don Goodman proposed that a continuation of the Vinyl Institute funding of \$25,000 be included in the next fiscal year (FY'92-'93 budget).

Don further noticed that reproductive toxicity looms as a big issue with components of solvent cements and that he would be attending a meeting at NSF on December 4 on this issue.

The following assignment was agreed to:

Don Goodman will request that Dick Church of PPFA issue a financial statement on funds received vs. expenses incurred.

Because of its relationship to the solvent cement issue, Roy Gottesman briefly discussed the current status of the California EIR involving contacts with the Housing and Community Development Department as well as SRI to develop a defensible environmental impact report.

C. Incineration - Swedish/Norwegian Studies

Dr. Magee provided an historical view on the work carried out relative to incineration of municipal solid waste containing PVC. Despite the Pittsfield Study, across Europe there continues to be a widespread perception that the presence of PVC in municipal solid waste is responsible for increased emissions of dioxins and furans. The studies being carried out the University of Umea in Sweden and at the Norwegian Center for Industrial Research (SI) confirm the definition of the role that vinyl plays in emissions of dioxins/furans and consequently to gain a greater acceptance for incineration of PVC in the European community. A steering committee consisting of incineration experts (including Prof. Alfons Beukens from Belgium, Prof. H. Vogg in Germany, Prof. Christofer Rappe from Sweden and Dr. Magee) has been established to guide this program.

Dick Magee reported that the third steering committee meeting was held in Gotenborg, Sweden on November 4 and 5 and was attended by Roy Gottesman and he at which time both the Swedish and Norwegian projects were reviewed.

The Swedish project has been delayed by six months due to problems encountered in cooling the exit gases from the pilot incinerator. A new revised cooling train including the potential for cooling by water via a concentric tube heat exchanger has now been fabricated and is undergoing testing. Agreement was reached to start stage one of this experimental program using the existing supply of feed pellets to verify incinerator operation, stability, memory effects and reproducibility. This should be completed by the end of 1991. A discussion of the pellet feedstock for stage two

led to a decision to use pellets that will be newly prepared in which gelatin (in place of bone meal which can contribute to ash), iron sulfate hydrate (to replace iron), copper sulfate (to replace copper chloride) at a reduced level and water to desirably a 20-30% level will be used.

There was agreement on the ultimate test plan for stage two experiments using the newly prepared feed pellets which will not get started until February, 1992. Six runs in triplicate are to be carried out involving normal waste with approximately 1% chlorine down to low levels of chlorine (about 0.1%). The pellets are to be analyzed to assure that homogeneity and desired metal levels have been reached.

Dr. Magee indicated that he believes the Swedish study is moving in the right direction. The Umea team will issue monthly reports hereafter.

The following assignment was made:

1. Dick Magee will check with the Swedish workers to assure that monthly reports are issued.
2. Roy Gottesman will discuss the receipt of monthly reports with Dr. Werner Freiesleben in telephone contact on December 9.

With regard to the Norwegian project, the small combustor has been redesigned and rebuilt with a four-jet tangential inlet of preheated air at the bottom and an extended feed inlet tube, which appears to improve combustion. Nevertheless, the off-gas analysis shows spikes of carbon monoxide indicating the necessity for better control of the feed, possibly with a continuous feeding mechanism.

In the Norwegian work, radioactive PVC with Cl^{36} was made by isotopic exchange from PVC in solution and approximately a 50% chlorine substitution was achieved. Dick Magee voiced his view that the Norwegian study will not be of any great value. While it will focus on the distribution of radioactive chlorine, both organic and inorganic, to alleged dioxins/furan precursors, it is not directly linked with the Swedish study. However, it may be useful in analyzing and interpreting Swedish precursor gas measurements.

The next review meeting is scheduled to be held in Umea in early April, 1992 and Dick Magee and Roy Gottesman will plan to attend. Dick Magee projected completion of both studies by the end of 1992.

The group agreed to include an additional \$10,000 in the budget for support of this study during FY'92-'93.

Dick Magee indicated that he had received the first version of a literature review on methods to control or recycle hydrogen chloride carried out by a graduate student at NJIT. He noted that this study needs more work including an evaluation of methods that are applicable.

The following assignment was made:

Dick Magee to develop a proposal for HCl recovery including costs and timing.

A memorandum from Gabe Lefebvre to Fred Krause relating to some work on the development of a dioxin suppression inhibitor by Diochem, a company in Waterloo, Ontario, was discussed. Apparently this inhibitor for dioxin formation during incineration is being tested in Europe.

The following assignment was made:

Dick Magee is to contact Dr. Frank Karasek at the University of Waterloo to gain further information regarding this development. (It could be of interest for incorporation in the Swedish incineration studies.)

D. Life Cycle Analysis - Chem Systems Draft Report

Roy Gottesman discussed his meetings in Europe with Dr. Vince Matthews of the Plastics Waste Management Institute and Dr. Ian Boustead concerning the Chem Systems draft report. Dr. Matthews expressed concern that the Chem Systems energy analysis which was based on 1980 work by Kinder and Nikles of BASF is flawed and has been discredited. Further, Dr. Boustead indicated that the data for glass plants was out of date, the literature review was "very thin", the information is dated and the report, if issued unchanged, could reduce Chem Systems credibility.

For these reasons, Roy Gottesman indicated that he had asked Ron Cascone of Chem Systems, Inc. to hold any further work on the report.

In the interim, the report is to undergo review in Europe by Dr. Boustead, Dr. Gustaf Sundstrom in Sweden, and Dr. Paul Fink at EMPA in Switzerland, all recognized experts in the LCA field.

Further, Roy Gottesman indicated that he had been in contact with Dr. Boustead providing him with a copy of Ron Cascone's paper at an IRI conference in Washington in September as well as the diskette supplied by Chem Systems on their LCA program.

Further, he has asked Dr. Matthews to be sure that the three European consultants provide specific details in their critique so that we can have Chem Systems evaluate what it would take to have their report put into a final form that considers the inputs and concerns of the European experts.

As a result of this, the final publication of the Chem Systems report will be delayed until the input is received from the European peer reviewers.

E. Medical/Health Effects

In a memo to Chuck Bush dated November 5, Bob Hinderer indicated that completion is nearing on the efforts to develop three additional manuscripts for the publication of the toxicity studies on primates and rodents to both HCl and PVC. Bob Hinderer indicated that he is hopeful that all papers will be ready for publication by the end of 1991.

Bob Hinderer has the continuing assignment to develop a compendium of significant publications relating to fire gas toxicity in the burning of PVC.

The following assignment was made:

Roy Gottesman took the assignment to contact Bob Hinderer to determine when this compendium can be expected to be completed.

IV. Update on VIGOR (Recycling) Activities

Roy Gottesman updated the group on the recent activities of The Vinyl Institute Group on Recycling (VIGOR) which is aimed at assuring the commercial recycling of vinyl plastics as part of the overall industry program.

He reviewed activities in the area of collection including the Nashville program at Steiner-Liff involving the establishment of a pilot program at three drop-off centers, the collection of vinyl siding in Rhode Island, the continuing efforts by member companies including Borden in Baton Rouge. The vinyl siding program with Shuman in the Northeast is to be reestablished.

He further discussed the various separation sortation projects including the program at NRT relating to the necessity for work in the reverse sort mode, and the cost, i.e., pricing of the NRT units. He further discussed a proposal developed in a program with the Council for Solid Waste Solutions to handle the third bale. A task group has developed an excellent business plan. The industry group has also agreed to proceed in forming a consortium for an "auto sort demonstration facility". This program is to be reviewed at a December 5 meeting and will be presented to the Vinyl Institute Board at its meeting on December 12.

A proposal has also been developed to sponsor the installation of an automatic sorting device in Florida in order to overcome opposition to continued use of vinyl packaging by Senator Kirkpatrick. A meeting date to present this proposal to the Senator is to take place on December 5 with Bill Carroll participating. The selection of a site for this program would be made by Senator Kirkpatrick via a response to a request for proposal (RFP) which has been prepared by the Vinyl Institute. Proposals are being obtained both from MSS/ASOMA and NRT to determine which of these devices would be included in the facility.

Also reviewed were the programs at DevTech/Carpco and the froth flotation technology to finally clean up PET from any PVC contamination.

Reclamation and clean up has been established in individual company efforts including conventional grind/wash/dry systems. Melt filtration is being worked on by individual companies with a commercial facility capable of handling all industry production expected to be available by year end.

Finally, Roy Gottesman noted that he has given a number of talks on the recycling of vinyl in order to publicize these activities. At this stage, it appears that while vinyl recycling is a technical success, the amounts obtainable from MSW are extremely low and the economics appear prohibitive to support a large-scale commercial vinyl recycling effort.

V. New Business

A. Sensory Irritation Studies

Roy Gottesman advised the group of continued contact with Anderson Laboratories, Inc. relating to their development of a method for estimating sensory irritancy of airborne chemicals. He indicated some questions of the validity of the testing procedure but, inasmuch as this now appears to be going through the ASTM process, he recommended the formation of a subcommittee from the Technical Committee to participate in the ASTM process for establishing a standard procedure for evaluating the off-gassing of materials in the built environment, including vinyl products. He expressed his concerns that unless we participate in such a program, we could end up with a test procedure that is prejudicial to vinyl materials.

The following assignments were made:

1. Roy Gottesman will provide Lee Fishbein with all of the background materials on this subject that he has.
2. Lee Fishbein is to explore participation in this process by the Columbus Coated Fabrics Division of Borden.

B. Epidemiologic Study on Workers Exposed to VCM

Roy Gottesman advised that a report of this study which appeared the September American Journal of Industrial Medicine was based on workers exposed to vinyl chloride prior to January, 1973. Review of this by Drs. Hinderer and Drumwright indicated that this is an old study under the sponsorship of the Chemical Manufacturers Association and was reported by Dr. Otto Wong without CMA approval.

C. ATSDR Revised Priority List

On October 17, the Agency for Toxic Substances and Disease Registry published a revised list of hazardous substances found at hazardous waste sites. This list includes vinyl chloride. A review of the document indicates that it has been significantly changed over the original draft version of this document. The report identifies additional data that is needed for some 38 hazardous substances.

The following assignment was made:

Frank Borrelli will see that the Health, Safety and Environment Committee determines whether a response by the Vinyl Institute will be made and how this is to be carried out.

VI. Partnership for Plastics Progress

Roy Gottesman provided a brief update on this new organization, its funding mechanism and planned activities.

VII. Budget Review

A. Current Year

Roy Gottesman reported that Technical Committee activities billed through October 31, 1991 totalled \$51,830. Considering known anticipated expenditures to the end of the current fiscal year, it appears that expenditures in the area of \$179,000 would be within the total approved budget for the Committee of \$187,500 for FY '91-'92.

B. Development of FY '92-'93 Budget

The group discussed and agreed upon the following listing of projects and expenditures to be included in a preliminary budget for FY '92-'93.

<u>Item</u>	<u>Dollars</u>
Fire/Combustion Studies including Consultants & Monitoring	\$ 50,000
Incineration Studies including support of European Work	20,000
Incineration Related Work	25,000
Evaluation of Incineration Costs and Retrofitting	
HCl Scrubbing	
Revision of LCA Report	20,000
Ad Hoc Solvent Cement Project	25,000
Sensory Irritation Studies (Identifying an Academic mission to follow these studies)	10,000
Medical/Health Compendium -- Editorship and Publication	15,000
Contingency (Nonspecified Projects)	<u>10,000</u>
TOTAL	\$175,000

Roy Gottesman indicated that he would send this budget to all committee members in early January with a request that they advise him if they have any other additional items to be considered for inclusion in the budget.

VIII. Review of Assignments

Frank Borrelli

See that the Health, Safety and Environment Committee determines whether a response by the Vinyl Institute will be made to the ATSDR listing of vinyl chloride and how this is to be carried out.

Lee Fishbein

Explore participation in the ASTM process to establish a standard procedure for evaluating the off-gassing of materials in the built environment, including vinyl products, with the Columbus Coated Fabrics Division of Borden.

Don Goodman

Request that Dick Church of PPFA issue a financial statement on funds received vs. expenses incurred by the Ad Hoc Committee on solvent cements.

Roy Gottesman

1. Provide Lee Fishbein with all of the background materials on the sensory irritation studies that he has.
2. Advise Carl Tripp that The Vinyl Institute will join in the latest round of testing to be carried out by the Polyolefins Fire Performance Council and will submit two advanced performance vinyl materials.
3. Discuss the receipt of monthly reports regarding the Swedish Incineration project with Dr. Werner Freiesleben in telephone contact on December 9.
4. Contact Bob Hinderer to determine when the compendium of significant publications relating to fire gas toxicity in the burning of PVC can be expected to be completed.

Bud Hall

1. Confirm the cost to be paid to Safety Engineering Laboratories including the basis for the \$10,000 management fee, negotiating if it appears realistic for a lower fee.
2. Identify the best Plenex[®] material to be included in the testing program carried out by the Polyolefins Fire Performance Council and will also advise Roy Gottesman.

Dick Magee

1. Review the experimental corrosion testing program, critique this and make any suggestions with regard to the experimental design.
2. Check with the Swedish workers to assure that monthly reports are issued.
3. Develop a proposal for HCl recovery including costs and timing.
4. Contact Dr. Frank Karasek at the University of Waterloo to gain further information regarding the development of a "dioxin" inhibitor. It could be of interest for incorporation in the Swedish incineration studies.

Lou Maresca

1. Confirm the BFGoodrich costs on the corrosion testing program.
2. Identify the best Flexel® material to be included in testing carried out by the Polyolefins Fire Performance Council and will advise Roy Gottesman of same.
3. Determine the estimated completion date for the HCl Decay Modeling and likely costs for completion of the work.
4. Check with Marcelo Hirschler and others intimately involved with the NFPRF program at BFGoodrich to determine the status of the NFPA Fire Risk Assessment program.

IX. Meeting Date and Place

The next meeting of the Technical Committee will take place on Thursday, March 12, 1992 at the New Jersey Institute of Technology in Newark. The group will meet for dinner the prior evening. Further details will be provided when arrangements are completed.

X. Adjournment

The meeting was adjourned at 2:20 p.m.

Respectfully submitted,


Roy T. Gottesman

RTG/bg
Enc.