

Tom B. O'Keefe
Note & return
H. J. O'Keefe
11/6/83

DISTRIBUTION

FROM
E. M. BEGNAUD

FIELD NUMBER OR SERIAL NUMBER
D/5429

DATE THIS LETTER
10/28/83

SUBJECT

REVISED LABELING PROCEDURES FOR GEON RESINS/COMPOUNDS

Attached are the updated BFG labeling procedures for VCM and Geon resins/compounds. The procedures supercede all prior instructions and become effective 12/05/83.

These procedures are based on a Management approved proposal developed by a CAT team assigned to review current labeling policy. Based on these facts, it is concluded for PVC resins and compounds with equal to or less than 8.5 ppm RVCM, the AVCM will be less than 0.5 ppm. The storage, transportation and thermal processing of these products will result in worker exposure less than 0.5 ppm AVCM over an 8-hour day.

The CAT proposal was assigned to a "PVC Labeling Implementation Task Force". The purpose of the task force was to establish detailed requirements for the labeling of PVC products and develop plans for the implementation of these requirements. Our customers have been informed of this new policy and the reasoning behind it. The attached reference on vinyl studies supplies further background on this subject.

Please review the attached policy with all applicable employees during November to assure that they thoroughly understand these procedures. The Manager responsible for Distribution, at each facility, must confirm to us, in writing, that implementation of the new labeling procedure is understood, acceptable and will be implemented on December 5, 1983.

It is suggested that whenever possible, older inventories of labeled products be shipped to customers first. It will not be necessary to block out existing marks from inventories during the transition period. Excluded are International orders where no shipments of material in excess of 8.5 ppm RVCM are to be shipped.

Your cooperation in this matter is appreciated. We will be available to help answer questions you may have regarding this revised procedure.

EMB/smh
4882v/29/1

EQ.

NGC 16337

DISTRIBUTION

CLEVELAND

N. R. Aquino
R. C. Kaminski
F. E. Krause
D. P. Knechtges
G. F. Lefebvre
T. Grabenstetter
J. E. Gulas
G. D. Schaaf
W. E. Bigley
B. T. Gordon
H. Waltemate
P. P. McCann
D. G. Kramer
B. F. Stefanek
G. L. Huber/
R. W. Tannehill
P. C. Dunnigan
A. J. Olson
H. S. Hall
W. S. Robertson
R. M. Rosenau
D. H. Marshall
R. A. Ellis
B. C. Birkmeier
B. Healy
B. K. Bolock
C. P. Gambrill
E. M. Begnaud
D. M. Murray
B. C. Birkmeier
J. E. Schuller
M. L. Rogers

NIAGARA

C. Lee
D. Piriano
R. Woodruff
R. Oliver

LA PRESA

R. Sanchez

AKRON

H. E. Phelps
L. C. Wagner
W. L. Leach

AVON LAKE

W. E. Horton
J. R. Schellenberger
D. Quester
B. C. Knoble
D. J. Gargas/W. L. Weitzel

DEER PARK

W. C. Fultz
M. L. Pulley
R. B. Kitchen
C. F. Heywood/A. Haverland

PLAQUEMINE

R. M. Sandfry
K. C. Recko
T. Neff

KITCHNER

F. V. Hovey
D. A. Brooks
T. J. Fitzsimmons

SHAWINIGAN

C. Bayard
R. Hamel

ALTIMARA

E. Pruneda

ALTC

R. M. Kreager
R. Bloor
E. M. Faber
P. M. Taylor
L. P. Tenny

CALVERT CITY

W. D. Morse
G. E. Evens
G. R. Black

LA PORTE

L. V. Goode
R. M. O'Donel
J. S. Robinson
J. J. Schnoart

HENRY

R. J. Grahek
R. V. Tebbutt
A. W. Otto/
S. E. Wiedma
F. Y. Zemanek

PEDRICKTOWN

D. E. Frey
M. T. Slimbars
J. W. Goetsch
C. M. Stolfo
D. W. Bailey
J. E. Delaney
D. P. O'Keefe

LOUISVILLE

E. L. Beeler
R. S. Kinnamon
A. Brightwe
R. R. Mueller/
R. H. Coon
H. J. Kletke
J. W. Robben

MEXICO CITY

E. Alarcon
D. Saldana
T. Torrero

CONVENT

J. D. Corona

LONG BEACH

P. W. Shore
R. K. Miller
E. A. Pancallo
Z. Ahmed

GENERAL LABELING REQUIREMENTS FOR VCM & GEON RESIN/COMPOUNDS

The guidelines listed below, plus the attached detailed procedures for specific "packages", cover the VCM/PVC labeling requirements of BFGCG effective December 5, 1983.

1. All VCM tank cars must be labeled.
2. Geon latex will not be labeled.
3. PVC suspension, dispersion and mass resins and compound (including off grade and scrap) will not be labeled if they are at 8.5 ppm RVCM or less when shipped from U.S. manufacturing facilities. If greater than 8.5 ppm the attached reference labeling methods should be used in order to assure consistent identification.
4. Labeling of blending resin products numbers 212 and 213 will be required when their RVCM is greater than 8.5 ppm as it is in most instances. Export orders for 213 must be specially manufactured to obtain a RVCM not greater than 8.5 ppm to meet International requirements of non-labelling.
5. Any commercially produced U.S. resin or imported resin (e.g.: Mexico or Canada) will be required to be equal to or less than 8.5 ppm RVCM at the time of shipment and therefore not require labeling.
6. No international shipments are to be labeled, therefore all materials being exported must be equal to or below 8.5 ppm RVCM.
7. Exceptions to this policy will require that a special customer request (SCR) be approved and included in the remarks section of the Factory Order.

Attached References

- VCM Rail Car Labeling Method.
- PVC Bulk Hopper Car and Truck Labeling Method.
- PVC Bag Labeling Method.
- PVC Box Labeling Method.
- Miscellaneous Packages & Samples Labeling Method.
- Vinyl studies

VCM RAIL CARS

All VCM tank cars must be labeled with the word "Cancer Suspect Agent" in 1/2" high letters. A stencil will be placed on two opposite sides of the tank car dome; they will be placed on the sides of the dome parallel to the length direction of the car. The Calvert City and LaPorte plants will apply the dome markings.

4882v/29/4

NGC 16340

GEON RESIN & COMPOUND BULK TRUCKS AND HOPPER CARS

All existing labels and tags will need to be removed from bulk trucks and hopper cars that contain PVC materials equal to or less than 8.5 ppm RVCM.

We are to use a single trip service tag (approximately 3" x 5") (BFG 16590A) for marking inlets and outlets for specified resin and compound bulk trucks and hopper cars that contain PVC above 8.5 ppm RVCM. These tags will read:

POLYVINYL CHLORIDE
CONTAINS
VINYL CHLORIDE
VINYL CHLORIDE IS
A CANCER-SUSPECT AGENT
Notice
Open, Handle and Use
Under Well Ventilated Conditions
For details refer to occupational
safety and health standards Chapter XVII Part 1910
of the Dept. of Labor, U.S. Gov't dated Oct. 4, 1974
and subsequent revisions

The required statement is in 3/8" high letters. The tags are off-white with black lettering. The statement is printed on both sides of the tag. The tags are supplied with eyelets and wire ties attached.

On bulk trucks a tag (BFG 16590A) shall be tied to the exterior of each top loading port and/or manway. One shall also be attached at the end (discharge point) of each trailer unloading line(s).

On bulk hopper cars a tag (BFG 16590A) must be tied to each inlet and outlet. One should be placed on each top manway hatch. A tag shall also be attached to each unloading tube cap.

Requirements for these tags (BFG 16590A) can be ordered by using a Forms Requisition. This requisition should be sent to the Corporate Forms Group.

GEON RESINS AND COMPOUNDS IN BAGS

It is necessary to label (or stamp) each bag of PVC above 8.5 ppm RVCM, prior to filling or shipment (in the case of filled bags), containing designated products. The following label (or stamp) will be used on each bag:

POLYVINYL CHLORIDE
CONTAINS
VINYL CHLORIDE
VINYL CHLORIDE IS
A CANCER-SUSPECT AGENT

The statement is in 1/4" high letters. All label printing is in BFG red on kraft colored pressure sensitive label stock (BFG 16591A). Any packages shipped individually, as non-unitized loads, must have one of the above specified labels affixed to each individual container. Hand stamps or machine applied printing, containing the required statement in 1/4" high letters is an acceptable alternate to labels.

Hand stamping or machine printing ink will be black. These hand stamps/printing may be used as an alternate to labels. Labeling/stamping/printing should be done in a clear area on the bottom end of each bag where the product and lot identification is located.

Requirements of labels (BFG 16591A) can be reordered by using a Forms Requisition. This requisition should be sent to the attention of the Corporate Forms Group.

4882v/29/6

NGC 16342

GEON RESINS AND COMPOUNDS IN SEMI-BULK BOXES

One label (BFG 16591A) should be placed on each large side panel (2 labels/box) to the left of the Geon Vinyls logo on specified Geon products with an RVCN greater than 8.5 ppm. The following label is to be applied to these boxes:

POLYVINYL CHLORIDE
CONTAINS
VINYL CHLORIDE
VINYL CHLORIDE IS
A CANCER-SUSPECT AGENT

The statement is in 1/4" high letters. All printing is in BFG red on kraft colored, pressure sensitive label stock.

Hand stamps containing the required statement in 1/4" high black letters is an acceptable alternate to labels.

Requirements for form BFG 16591A can be reordered by using a Forms Requisition. This requisition should be sent to the attention of the Corporate Forms Group.

4882v/29/7

NGC 16343

MISCELLANEOUS PACKAGES & SAMPLES

We occasionally package small volumes of Geon resins or compounds in excess of 8.5 ppm RVCN in special bags, boxes, fibre drums, etc. These containers frequently contain no Company identification. Each of these packages must be labeled. Excluded are International orders where no shipments of material in excess of 8.5 ppm RVCN are to be shipped.

POLYVINYL CHLORIDE
CONTAINS
VINYL CHLORIDE
VINYL CHLORIDE IS
A CANCER-SUSPECT AGENT

The required statement is in 1/4" high letters. This pressure sensitive label will normally be in BFG red (BFG 16591A) on kraft colored label stock.

A label shall be neatly applied to each container.

These labels can be reordered by using a Forms Requisition. This requisition should be sent to the attention of the Corporate Forms Group.

PVC resins or compounds in excess of 8.5 ppm RVCN are also sometimes distributed in sample (less than standard package) quantities. The inside containers must also be marked to comply with procedures. If containers are large enough, labels as specified above should be used. For small sample containers attach a tag (BFG 16590A) as specified under the "Geon Resin & Compound Bulk Trucks and Hopper Cars" sections of these procedures. Excluded are International orders where no shipment of material in excess of 8.5 ppm RVCN are to be shipped.

Since the purpose of the procedure is to inform the person opening the container of a possible hazard, all sample containers should be placed in an "overwrap" package. We recommend that the outer package not contain the statement.

VCM sample containers shall be labeled or stenciled with the wording "Cancer-Suspect Agent". This lettering shall be 1/2" high. It should be located in the area of the 3" x 3" DOT Hazardous Materials "Flammable Gas" label affixed to each VCM container.

VINYL STUDIES

Within the past several years, significant advancements have been made in the PVC industry to minimize employee exposure to vinyl chloride monomer (VCM). Improvements in PVC manufacturing processes to reduce residual vinyl chloride monomer (RVCM) content of finished resins have been a key factor in maintaining acceptable atmospheric vinyl chloride monomer levels (AVCM) in work areas during storage, shipment and thermal processing.

Our knowledge and understanding of the diffusion^{1/ 2/} of VCM out of finished PVC resins under storage conditions and during thermal processing are also much improved based on extensive experimental data, modeling studies and work place monitoring.

Based on these facts, it is concluded for PVC resins and compounds with 8.5 ppm RVCM or less, the AVCM will be less than 0.5 ppm over an 8-hour day. The storage, transportation and thermal processing of these products will result in worker exposure less than 0.5 ppm AVCM over an 8-hour day.

Diffusion of VCM

The diffusion of VCM out of PVC resin is dependent on several critical factors:

- Particle size
- Particle porosity
- Temperature

The concentration of AVCM that can accumulate in enclosed work areas is additionally affected by:

- Resin quantity/storage volume ratio
- Ventilation rate of work area
- Residence time
- RVCM content of the resin

Using the above variables and data obtained from diffusion experiments, models have been developed that allow determination of the maximum concentration of AVCM that can occur under a wide variety of conditions. Additionally, monitoring of work place atmospheres has been carried out for a number of years. The results of this "real world" monitoring have confirmed the validity of the developed models.

Storage and Warehousing of Resin

The development of a model that allows determination of AVCM in large storage areas presents a number of special problems. Many types of resins containing different quantities of RVCM are frequently moved in and out of the storage enclosures. Additionally, the diffusion rate of VCM out of resin at room temperature is very slow and does not follow the ideal behavior exhibited at higher temperatures (above the glass transition temperature). Consequently, it was necessary to study the behavior of stored resin in large-scale experiments designed to simulate warehouse storage conditions. The variables and ranges studied included:

- Temperature - 74 to 115°F
- Ventilation rate - 0.5 - 3.0 turnovers/hour
- Loading (PVC volume/storage volume) 11 - 34%
- Resin RVCM - 0.01 - 123 ppm
- Storage time - 1 - 170 hours

Using a Computer Optimized Experimental Design (COED), 24 large-scale experiments were selected to study the above listed variables to define their effects on atmospheric VCM in a storage compartment or warehouse. A multiple correlation analysis of these experimental results permitted the derivation of a model^{3/} which can be used to predict any combination of the variables studied. Thus, it is possible to predict the atmospheric concentration of VCM in a storage area under the worst conditions of temperature, ventilation rate, loading and storage time. Based on these considerations, it was determined that the OSHA action level is not exceeded when the RVCM content of PVC resin is 8.5 ppm or less.

The validity of this model was confirmed by ambient air monitoring in BFGoodrich warehouse facilities in three locations over a one-month period. The measured atmospheric VCM level in these warehouse facilities was in excellent agreement with predicted results based on the developed model. Thus, "real world" monitoring was used to confirm the model based on experimental data. A more detailed description of this work is reported in the Journal of Vinyl Technology (Vol. 1, No. 3, September, 1979).

Transportation of Resin

Since compartments used for transporting PVC resin (such as trucks and railway cars) are in effect a mobile warehouse, the previously described model for a warehouse can also be applied to shipping compartments. The variables included in the transportation model included:

- Temperature
- Ventilation rate
- Loading
- Resin RVCM content
- Residence time

Obviously, the range of some of the variables is somewhat different than in a warehouse (e.g., loading, ventilation and residence time). As in the warehouse study, the derived model was used to determine AVCM for worse-case situations, i.e., high loadings, high ambient temperatures, low ventilation rates and longest expected residence time.

Based on the above model, AVCM in a shipping compartment will not exceed the OSHA Action Level provided the resin RVCM content is below 10 ppm. Again, as in the warehouse study, a significant amount of "real-world" monitoring of atmospheric VCM in shipping compartments has been done to confirm the validity of the transportation modeling study.

Thermal Processing of PVC

In the thermal processing of PVC, the variables affecting the relationship between RVCM and atmospheric VCM are, of course, somewhat different than those expressed for warehousing and transportation. A similar approach to modeling can be used, however, when these variables are considered:

- RVCM content of resin or compound
- Volume of processing building
- Processing rate, pounds/hour
- Ventilation rate, air turnovers/hour
- Building temperature
- Percent of VCM lost in thermal processing

This latter variable, percent of VCM lost in thermal processing, has been determined experimentally for a wide variety of resins and compounds.

Again, using a set of worse-case conditions, the developed model was used to determine the relationship between RVCM in resin or compound and atmospheric VCM in the work place. This model shows that the OSHA action level will not be exceeded when the RVCM level is below 32 ppm. A significant amount of personnel monitoring has also been done in PVC thermal processing areas to confirm the validity of the developed model.

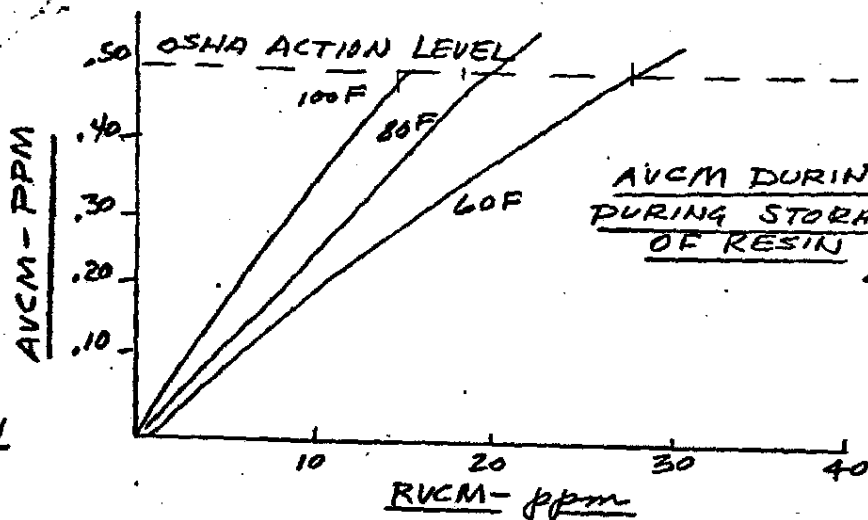
Summary

The relationship between RVCM in PVC resin or compound and AVCM in work place areas, used for storage, transportation and thermal processing of PVC, has been subjected to intensive study. Models have been developed to determine AVCM level under the most adverse conditions. The validity of the models has been confirmed by "real-world" monitoring. When the RVCM content is 8.5 ppm or less, the storage, transportation or thermal processing will result in worker exposure less than the action level of 0.5 ppm AVCM during an 8-hour day.

References

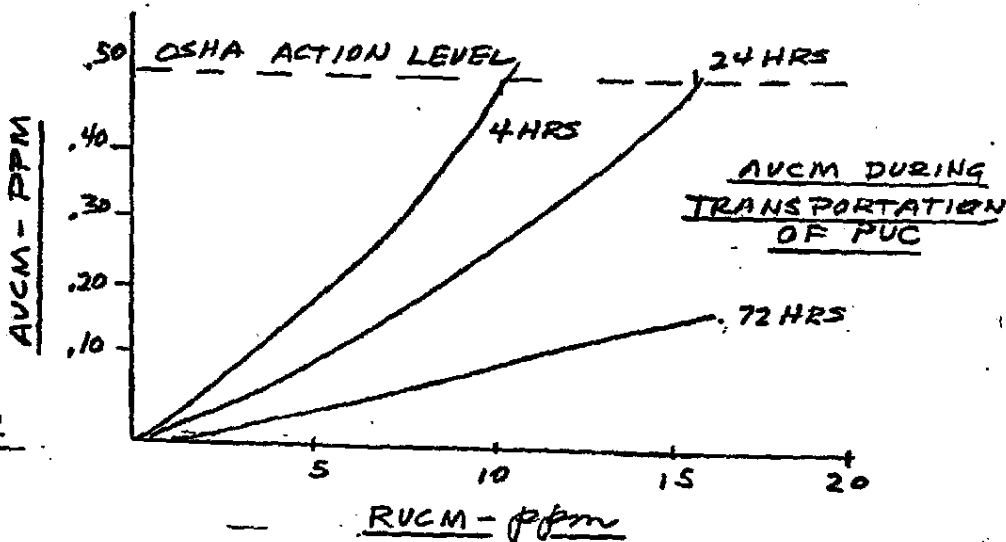
- 1/ A. R. Berens, Polymer Preprints, 15, 203 (1974)
- 2/ A. R. Berens, L. B. Crider, C. J. Tomanek & J. M. Whitney, Journal of Applied Polymer Science, 19, 3169 (1975)
- 3/ L. B. Crider, M. M. O'Mara, R. L. Bowles, Journal of Vinyl Technology, 1, 168 (1979)

9.1

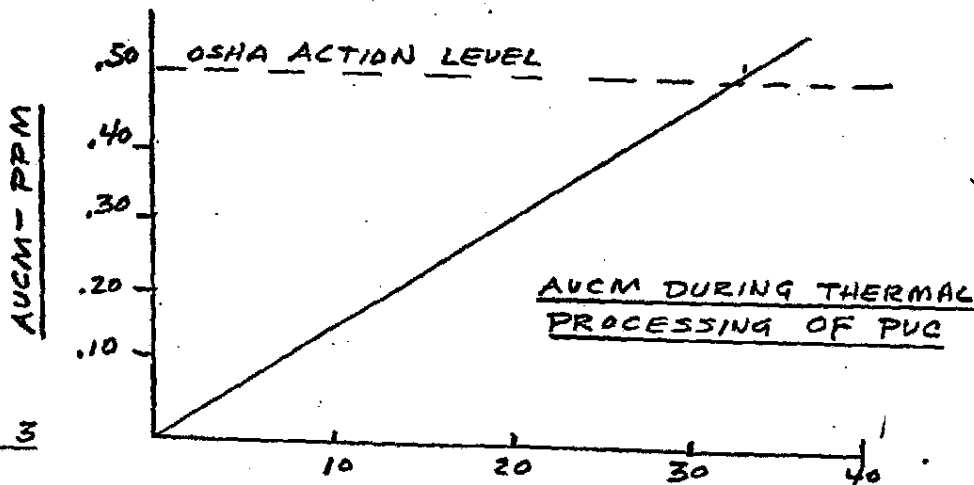


VENTILATION = 0.5
TURNS/HR
RESIN VOL/WAREH
VOL = 30%

19 2



19 3



NGC 16349