INTEROFFICE MEMORANDUM

Sensitivity: COMPANY CONFIDENTIAL

Date: 24-Jun-1999 05:02pm
From: Eric Peterson TPA 813/744-6100
Eric.Peterson@dep.state.fl.us
Dept:
Tel No:

To: Cindy Phillips TAL 850/921-953 (Cindy.Phillips@dep.state.fl.us)

Subject: Re: Reinforced Plastics Styrene Emission Factors

Cindy,

I'm faxing you the Xerxes request with the table of UEF factors. We told them they can continue to use the old emission factors and that the description in their Title V permit should be updated to reflect the use of flow choppers. We will update the description through an Administrative Correction.

XERXES®
CORPORATION

May 20, 1999

D.E.P.
MAY 24 1999
Southwest District Tampa

Sent By Certified Mail -
Return Receipt Requested

Post-it® Fax Note 7671	Date 6/24/99 # of pages ▶ 4
To Cindy Phillips	From Eric Peterson
Co./Dept. DARM	Co. DEP SWD
Phone #	Phone # SC: 512-1042 x112
Fax #	Fax #

Richard D. Garrity, Ph.D.
Director of District Management
Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, FL 33619

Re: Proposed Title V Permit No.: 1050183-002-AV
Air Permit No. A053 – 242168
Xerxes' Lakeland Plant

Dear Mr. Garrity:

It has come to Xerxes' attention that the emission factor used in Xerxes' Title V Permit Application and its underlying Air Permit, should be modified due to a change in the way emissions are estimated. Although Xerxes' production process has not changed, and production capacity has not increased, certain changes in reported emission rates have occurred.

When Xerxes originally applied for its permit, the plant emission rates were based upon the U.S. EPA AP-42 factors, which established an emission factor of 5% by resin weight or 11% of the available styrene. The U.S. EPA rescinded those AP-42 factors and indicated that companies using styrene in their process should utilize the emission factors established through testing conducted by the Composite Fabricators Association "CFA." If the CFA factors were not used, emission factors should be based upon actual source testing as the best available data. Subsequently, the CFA emission factors were revised and updated and are now called the Unified Emission Factors ("UEF"). The UEF emission factors are set forth in the enclosed document entitled "Unified Emission Factors for Open Molding of Composites." See Exhibit A. These emission factors are based on styrene content of resin, coupled with the method of application, such as manual, mechanical atomized and mechanical non-atomized, along with use of non-vapor suppressed or vapor suppressed resin. For instance, mechanical atomized application using non-vapor suppressed resin with 46% styrene content has an emission factor of

297 lbs. of styrene per ton of resin or gelcoat processed. This equates to an emission factor of 14.9% of the resin or 32.2% of the styrene. Mechanical non-atomized application at 46% styrene content has an emission factor of 111 lbs. of styrene emitted per ton of resin or gel coat. This equates to 5.6% of the resin or 12.17% of the available styrene. These factors are based on the enclosed UEF as posted on the U.S. EPA Bulletin Board, and vary according to the styrene content in the resin.

The U.S. EPA, however, has indicated that actual sampling of process emissions is the best available data for estimating emissions and should be used instead of the UEF factors where available. Indeed, after conducting stack testing on Xerxes' Texas facility, the Texas Air Control Board (k/n/a Texas Natural Resource Conservation Com-mission "TNRCC") mandated an emission factor of 8% of the resin weight. Subsequent testing conducted at Xerxes' Ohio facility in 1997, showed a similar emission factor of 8.3% as a percent of resin (the 0.3% is within normal experimental error) while using mechanical atomized application, with non-vapor suppressed resin. Based on these tests, which are specific to Xerxes' underground storage tank ("UST") operations that are virtually identical from one Xerxes' facility to another, Xerxes believes that the most accurate factor for styrene emissions from its manufacture of underground storage tanks, using mechanical atomized application, is 8% of the resin weight.

Please be advised that the change in emission factors will increase the reported annual and hourly emissions somewhat for Xerxes' Lakeland, Florida facility, which has a maximum annual resin cap of 3,000,000 lbs. and an hourly limit of 37.5 lbs. of styrene as a daily maximum. The effect on the Lakeland, Florida plant's annual emissions by increasing the emission factor from 5% as originally established by AP 42, to the 8% figure will increase annual emissions from 75 tons to 120 tons. Accordingly, Xerxes is considering the use of flow choppers at its Lakeland, Florida facility and plans to replace the airless spray guns with flow choppers in the near future. This change will significantly reduce the amount of emissions from Xerxes' facility, although they will be slightly higher than is currently allowed under the permit. It appears, therefore, that Xerxes must amend its permit to reflect these changes.

However, since Xerxes plans to implement flow choppers in an effort to reduce styrene emissions, and in an effort to anticipate compliance with the "Maximum Achievable Control Technology ("MACT") standard by 2001, Xerxes has already begun experimenting with the use of flow choppers (mechanical non-atomized application) rather than airless spray guns (mechanical atomized). Dr. Robert Haberlein of Engineering Environmental, Inc., recently conducted stack testing at Xerxes' Ohio facility where experimental flow choppers are already in use. The emission rate from Xerxes' underground storage tank molding process while using flow choppers was 12.2% of the available styrene, or

5.7% of resin weight using 47% styrene content. This was exactly identical to the emission factor for mechanical non-atomized in the UEF table, attached as Exhibit A. Accordingly, Xerxes proposes to use the UEF model in calculating its emissions for flow choppers..

Since the 8% emission factor will soon be reduced by implementation of flow choppers, Xerxes would like to amend its air permit now to reflect the UEF emission factor for mechanical non-atomized application. This will alleviate the need to again amend its Title V and Construction Permits. Xerxes requests authorization to utilize the mechanical non-atomized emission factor in filing for its present Amendments to the Title V and Construction Permits, since it will implement the flow chopper technology in the near future.

Please advise if this approach to handling the change in emission factors is acceptable, and Xerxes will proceed accordingly. If it is not acceptable, please advise me how Xerxes should proceed.

Thank you for your attention to this matter.

Very truly yours,

Craig D. Peterson
General Counsel

CDP/bk
cc: Neil Olsen
Mike Zais
Sam Kipe
Gerald Kissel, P. E.
James L. McDonald
Dr. Robert Haberlein

Unified Emission Factors for Open Molding of Composites

Emission Rate in Pounds of Styrene Emitted per Ton of Resin or Gelcoat Processed

Application Process

Styrene content in resin/gelcoat, % [1]	<33 [2]	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	>50 [2]
Manual	0.126 x %styrene x 2000	83	89	94	100	106	112	117	123	129	134	140	146	152	157	163	169	174	180	((0.286 x %styrene) - 0.0529) x 2000
Manual w/ Vapor Suppressed Resin VSR [3]	Manual emission factor [listed above] x (1 - (0.50 x specific VSR reduction factor for each resin/suppressant formulation))																			
Mechanical Atomized	0.169 x %styrene x 2000	111	126	140	154	168	183	197	211	225	240	254	268	283	297	311	325	340	354	((0.714 x %styrene) - 0.18) x 2000
Mechanical Atomized with VSR [3]	Mechanical Atomized emission factor [listed above] x (1 - (0.45 x specific VSR reduction factor for each resin/suppressant formulation))																			
Mechanical Atomized Controlled Spray [4]	0.130 x %styrene x 2000	86	97	108	119	130	141	152	163	174	185	196	207	218	229	240	251	262	273	0.77 x ((0.714 x %styrene) - 0.18) x 2000
Mechanical Controlled Spray with VSR	Mechanical Atomized Controlled Spray emission factor [listed above] x (1 - (0.45 x specific VSR reduction factor for each resin/suppressant formulation))																			
Mechanical Non-Atomized	0.107 x %styrene x 2000	71	74	77	80	83	86	89	93	96	99	102	105	108	111	115	118	121	124	((0.157 x %styrene) - 0.0165) x 2000
Mechanical Non-Atomized with VSR [3]	Mechanical Non-Atomized emission factor [listed above] x (1 - (0.45 x specific VSR reduction factor for each resin/suppressant formulation))																			
Filament application	0.184 x %styrene x 2000	122	127	133	138	144	149	155	160	166	171	177	182	188	193	199	204	210	215	((0.2746 x %styrene) - 0.0298) x 2000
Filament application with VSR [5]	0.120 x %styrene x 2000	79	83	86	90	93	97	100	104	108	111	115	118	122	125	128	133	136	140	0.65 x ((0.2746 x %styrene) - 0.0298) x2000
Gelcoat Application	0.445 x %styrene x 2000	294	315	336	356	377	398	418	439	460	481	501	522	543	564	584	605	626	646	((1.03646 x %styrene) - 0.195) x 2000
Gelcoat Controlled Spray Application [4]	0.325 x %styrene x 2000	215	230	245	260	275	290	305	321	336	351	366	381	396	411	427	442	457	472	0.73 x ((1.03646 x %styrene) - 0.195) x2000
Covered-Cure after Roll-Out	Non-VSR process emission factor [listed above] x (0.80 for Manual <or> 0.85 for Mechanical)																			
Covered-Cure without Roll-Out	Non-VSR process emission factor [listed above] x (0.50 for Manual <or> 0.55 for Mechanical)																			

Emission Rate in Pounds of Methyl Methacrylate Emitted per Ton of Gelcoat Processed

MMA content in gelcoat, % [6]	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	≥20
Gel coat application [7]	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	0.75 x %MMA x 2000

Notes

1 Including styrene monomer content as supplied, plus any extra styrene monomer added by the molder, but before addition of other additives such as powders, fillers, glass,...etc.

2 Formulas for materials with styrene content < 33% are based on the emission rate at 33% (constant emission factor expressed as percent of available styrene), and for styrene content > 50% on the emission rate based on the extrapolated factor equations; these are not based on test data but are believed to be conservative estimates. The value for "% styrene" in the formulas should be input as a fraction. For example, use the input value 0.30 for a resin with 30% styrene content by weight.

3 The VSR reduction factor is determined by testing each resin/suppressant formulation according to the procedures detailed in the *CFA Vapor Suppressant Effectiveness Test*.

4 See the *CFA Controlled Spray Handbook* for a detailed description of the controlled spray procedures.

5 The effect of vapor suppressants on emissions from filament winding operations is based on the *Dow Filament Winding Emissions Study*.

6 *Including MMA monomer content as supplied, plus any extra MMA monomer added by the molder, but before addition of other additives such as powders, fillers, glass,...etc.*

7 Based on gelcoat data from *NMMA Emission Study*