TECHNICAL SUPPORT DOCUMENT
JANUARY 2009

I. General Comments:

A. Company Information

1. Southwest Fiberglass, LLC
2. 4798 S. Julian Avenue, Tucson, AZ 85714

B. Background

The initial operating permit for this facility was issued to Mesa Fiberglass in November 1995. The operating permit was subsequently transferred to Southwest Fiberglass, Inc., in March 2001.

This April 2008 operating permit is the third five-year air quality permit issued to Southwest Fiberglass, LLC., (the Permittee) for their Reinforced Plastic Composites Production (RPCP) located at 4798 S. Julian Avenue, Tucson, Arizona.

C. Attainment Classification

This source is located in an area which is attainment for all pollutants.

II. Source Description

A. Process Description

Southwest Fiberglass LLC manufactures custom fiberglass storage tanks and ducts using reinforced plastic composites. The company uses three methods for applying the resins and gel-coats including hand lay-up (manual), controlled spraying (mechanical), and filament winding. The primary air pollutant (originating in the resins and gel coats) is styrene, designated as both a volatile organic compound (VOC) pursuant to Pima County Code (PCC) 17.04.340 and a hazardous air pollutant (HAP) pursuant to PCC 17.16.660.

All of the resin spray operations are conducted with chopper guns using fluid impingement technology (FIT) nozzles. The FIT nozzles mix the resin and catalyst in the spray gun so there are no emissions from mixing. There are no PM emissions from this operation since the overspray consists of large sticky droplets that quickly fall out of the air stream. The VOC and HAP emissions result from the evaporation of the unreacted styrene monomer in the resin as the mixing progresses.

None of the consumed resins or gel coats utilize a vapor suppressant. The primary clean-up solvent is Acetone. Southwest Fiberglass, Inc. is an existing major source of a single hazardous air pollutant (styrene), a synthetic minor source of VOC, and a true minor source of all other criteria pollutants.

Potential emissions from the facility are controlled by limiting the maximum usage of resins and gel coats per 12-month period per operation type (manual, mechanical or filament application).

Affected Emission Source Classification: Class I stationary source subject to the provisions of 40 CFR 63 Subpart WWWW National Emission Standards for Hazardous Air Pollutants: Reinforced Plastic Composites Production, the Pima County State Implementation Plan (Pima County SIP) and Title 17 of the Pima County Code, (PCC).

The Permittee has requested to maintain a limitation to keep VOC and HAP emissions below 100 tons per year, to avoid more stringent reductions required by the MACT standard for sources with greater than 100 tpy of emissions. Also, without this limitation, the source would constitute a "major emitting source" for VOCs within the meaning of 40 CFR 51.166, and would require the facility to go through a Prevention of Significant Deterioration (PSD) review.

B. Air Pollution Control Equipment

All resin spraying operations are conducted with spray guns equipped with fluid impingement technology (FIT) nozzles. Independent tests have demonstrated a reduction of styrene emissions from spraying operations using the FIT spray guns (Attachment 1, FIT test results). Southwest Fiberglass, Inc is not taking credit for using FIT technology and so PTE calculations do not account for this reduction. PDEQ therefore does not consider the application of FIT nozzles to be add-on control devices for this facility.

The use of FIT nozzles effectively change the application method from atomized to nonatomized (see definition of nonatomized mechanical application in 40 CFR 63 Subpart WWWW).

These FIT nozzles are required to be used on all spray equipment at all times.

III. Regulatory History

A. Testing & Inspections

Southwest Fiberglass (SWF) has had the following regulatory actions in the past:

- Notice of violation dated 01/27/95 for the operation of an air pollution source without a permit.
- Notice of violation dated 06/29/98 for failing to comply with an established material permit condition, failing to submit an annual compliance certification,
- Compliance Status Letter dated 06/27/01 for insufficient recordkeeping, failure to use polyester resin product compatible with the allowable weight styrene limitation.
- August 15, 2002, routine compliance inspection revealed source to meet permit requirements.
- Notice of Violation dated 09/07/04 for failing to conduct monthly on-site inspections in accordance with the permit conditions.
- Notice of violation dated 10/30/2008 for the absence of demonstrating compliance with the organic HAP emission limits in the applicable NESHAP Subpart WWWW standards.

Inspections have occurred regularly and Southwest Fiberglass, LLC is currently in substantial compliance with their existing permit conditions.

B. Excess Emissions

During an inspection in 2001 it was discovered that SWF had possible excess emissions when they exceeded the allowable styrene content in one of their resins. The material safety data sheet for the resin specified styrene content by weight of 40-60% verses the 50% maximum allowed in the permit. Results of the investigation demonstrated that the styrene content of the specific product was actually 46% and at that time no other enforcement action was warranted. (For guidance PDEQ informed SWF that when a product is given a range, the higher limit is taken as the value of product unless the Permittee can prove otherwise.)

IV. Emissions Estimates

The following emissions estimates are based on information presented in the application (See PTE Calculation Document).

Pollutant	Potential To Emit (Tons Per Year)
Volatile Organic Compounds (VOC)	80.0
Total Hazardous Air Pollutants (HAPS)	80.0

Potential emissions from the facility are controlled by:

1. limiting the maximum usage of resins and gel coats (lbs) per 12-month period per operation type (manual, mechanical or filament application);

2. limiting maximum organic HAP content (% by weight) of styrene per resin/gel coat application method as required in Table 3 and Table 7 of 40 CFR 63 Subpart WWWW.

V. Applicable Requirements

Federally Enforceable Regulations:

Title 40 of the Code of Federal Regulations Part 63:

Subpart WWWW	National Emission Standards for Hazardous Pollutants: Reinforced Plastics Composites Production. (See Appendix 2 of this TSD – NESHAP Subpart WWWW Regulatory Review)

State Implementation Plan, Pima County:

Rule 321	Emissions-Discharge: Opacity Limiting Standards and Applicability
Rule 343	Visibility Limiting Standard
Rule 344	Odor limiting Standard

Non-Federally Enforceable Regulations:

Pima County Code (PCC) Title 17, Chapter 17.16:

17.16.030	Odor Limiting Standards
17.16.040	Standards and Applicability (Visible Emissions)
17.16.050	Visibility Limiting Standards
17.16.400	Organic Solvents and Other Organic Materials
17.16.430	Unclassified Sources
17.20.010	Source Sampling, Monitoring and Testing
17.28.065	Excess Emissions

VI. Permit Contents

Each standard will be addressed relative to the corresponding standard in the previous permit. Where applicable, the citation of the related standard is included [in brackets].

A. Applicability

This is a Class I Stationary Source for a single HAP (styrene), a synthetic minor source of VOC and a true minor of all other pollutants.

B. Emission Limits/ Standards:

II.A Reinforced Plastic Composites Production

II.A.1 – Resin and gel coat material use limitation to avoid additional recordkeeping and monitoring requirements from 40 CFR 63 Subpart WWWW.

II.A.2 – Resin application limitation to comply with the resin limitation in II.A.1.

II.A.3 – Resin HAP percentage limitation per open molding operation and application method. Limitation provides the facility a method of demonstrating compliance with the emission limits identified in Table 3 in 40 CFR 63 Subpart WWWW.

II.A.4 – Resin HAP percentage limitation per open molding operation and application method. Limitation provides the facility a method of demonstrating compliance with the emission limits identified in Table 7 in 40 CFR 63 Subpart WWWW.

II.A.5 – White/off White pigmented gel coat styrene and methyl methacrylate limitation. Limitation provides the facility a method of demonstrating compliance with the emission limits identified in Table 3 in 40 CFR 63 Subpart WWWW.

II.A.6 – Other pigmented gel coat styrene and methyl methacrylate limitation. Limitation provides the facility a method of demonstrating compliance with the emission limits identified in Table 3 in 40 CFR 63 Subpart WWWW.

II.A.7 – Resin and gelcoat delivery system requirements to utilizing "fluid impingement technology" to produce a non-atomized stream on all spray coat delivery systems. Requirement allows the source to use a lower emission factor to determine the potential to emit identified in Table 3 in 40 CFR 63 Subpart WWWW.

II.A.8 – Work Practice Standards.

II.A.8.a – Compliance with HAP emission limitations and HAP content limits without the use of add-on controls.

II.A.8.b – Type of cleaning solvent use restriction, HAP containing materials storage operations and mixing operations.

II.B All Operations

II.B.1 – Operation and maintenance requirements for minimizing emissions at all times.

II.B.2 – The Odor Limiting Standard is unchanged from the previous permit.

II.B.3 – The Opacity Standard has been amended to reflect the April 2005 update to the Pima County Code.

II.B.4 – Visible Limiting Standard (Property boundary line standard).

II.B.5 – Material handling standard.

II.B.6 – Control of Air Pollution.

C. Monitoring Requirements:

III.A – Reinforced Plastic Composites Production.

III.A.1 – Material usage requirement.

III.A.2 – Resin usage by operation type requirement.

III.A.3 – Collection of material information.

III.B – All Operations.

III.B.1-6 – The monthly inspection requirements have been carried over from the previous permit.

D. Recordkeeping Requirements:

IV.A – Reinforced Plastic Composites Production.

IV.A.1 – Material usage (resin and gel coat) requirement to show compliance with II.A.1 & III.A.1.

IV.A.2 – Resin/gel coat usage by operation type requirement to show compliance with II.A.2 & III.A.2.

IV.A.3 – Monthly inventory/usage of resins in each operation type.

IV.A.4 – Yearly totals of resin used in each operation type.

IV.A.5 – Initial notification or notification of compliance status requirement from the MACT.

IV.A.6 – Start-up, shutdown and malfunction records.

IV.A.7 – Records of performance tests, design and performance evaluations (if required)

IV.A.8 – Compliance status report with all work practice standards.

IV.B – Format of Records.

IV.B.1-4 – Maintenance of all applicable MACT records in the format requested and as specified.

E. Reporting Requirements:

V.A – Reinforced Plastic Composites Production.

Semiannual reports of required monitoring:

V.A.1 – Total VOC and HAP emissions from each operation/application type.

V.A.2 – VOC and HAP 12-month rolling totals (in tons) of gel coats used.

V.A.3 – Summary of the results of the monthly inspections.

V.A.4 – Summary reports due dates when required to be submitted.

V.B – Compliance Certification Reporting requirements

V.C – Emission Inventory Reporting

V.D – Compliance Plan Requirements

F. Testing Requirements:

All testing requirements have been carried over from the previous permit unchanged [VI.A & B].

G. Miscellaneous Comments:

None

VII. Revised Previous Permit Conditions

Conditions that were previously cited as PCC 17.12.220 in the previous permit are now cited as PCC 17.12.190. In the 2005 Pima County Code revisions, PCC 17.12.220 was changed to PCC 17.12.190. PCC 17.12.220 now refers to compliance plan certification requirements.

The previous permit (September 2005 Revision) required a demonstration of compliance with the following limitations:

1. the amount of resin and gel coats per operation type per 12 month period;
2. the percent weight of styrene in the resin product;
3. the HAPs content of the resin product;
4. the percent weight of styrene and percent weight of methyl methacrylate in the gel coat product, and
5. the HAPs content of the gel coat product.

Continual demonstration of compliance with these emission limitations provides a method to meet the standards for open molding in 40 CFR 63 Subpart WWWW Table 3. The limitations are simply determined from comparing the emission factor in Table 1 to the emission limit in Table 3 of 40 CFR 63 Subpart WWWW.

Instances where the emission factor is calculated to be greater than the limit, the assumed organic HAP content for that particular operation is then reduced proportionally, for example: The PTE emission factor for open molding CR/HS filament application (Table 1 1.e.i) is 195.5 lbs/ton (assuming a 46.4 % organic HAP content); The corresponding emission limit in Table 3 for the same operation is 171 lb/ton. The resin used in this operation is thus required to be limited to: (((171/2000)+0.0298)/0.2746)*100 = 45.4 % organic HAP content.

The organic HAP content limit above is then used to determine the adjusted emission factor for the given application. This adjusted emission factor is calculated using the appropriate equation provided in Table 1 of the Subpart WWWW standard, i.e. (Table 1, Equation 1.c.i). The emission factor for open molding, CR/HS, mechanical application would then be: (0.157 x 0.456) – 0.0165) x 2000 = 110.1 lb/ton.

Potential emissions from the facility are controlled by limiting the maximum usage of resins and gel coats per 12-month period per operation type (manual, mechanical or filament application) and by the maximum organic HAP content (% by weight) per operation type.

The potential to emit calculations are based on each application operating at maximum capacity:

- Chopper Guns at 10 lbs resin per minute;
- Filament Winders at 15 lbs resin per minute; and
- Gel Coaters at 12 lbs gel per minute

The potential to emit is determined by simply multiplying the capacity of each application by the calculated maximum resin or gel coat usage. The potential to emit for VOC and HAPs was then simply reduced to below 100 tons per year by limiting the amount of resins and gel coats used each month.

The previous permit reference a synthetic minor limitation of 86 tons per year with a maximum resins usage of 1,238,510 lbs per 12 month period. The synthetic minor limitation in this renewal permit has been decreased to 80.0 tons per year whilst the maximum resins usage increased to 2,306,000 lbs per 12 month period. This decrease in the synthetic minor limitation and increase in resin usage is a result of the following:

1. All resin and gel coat spray operations are conducted with chopper guns using fluid impingement technology (FIT) nozzles.

2. The emission factor used in determining the emissions from spray operations using FIT control is 112.7 lb/ton (Reference Table 1, 1.c.i, 40 CFR 60 Subpart WWWW). The previous emission factor in Table 1, 1.d, 40 CFR 60 Subpart WWWW was incorrectly chosen to represent the facility operations; In reference to Footnote 5 of Table 1, there are no automated or robotic spray systems in use at the facility. The footnote recommends the use of the appropriate mechanical nonatomized equation for spray operations using hand held spray guns.

3. The source has ceased all spray painting operations (letter dated 09/25/07) and as a result, the previous surface coating permit conditions (reference in II.B) have been removed.

4. The emissions of methyl ethyl ketone peroxide (MEKP) are omitted in the potential to emit calculation since it was delisted from the federal list of HAPs on December 13, 2005.

The general requirement for the Permittee to develop and implement a written startup, shutdown, and malfunction plan pursuant to 40 CFR 63.5835 (d) does not apply as the facility does not use add-on control devices to meet any organic HAP emissions limits.

The omission of a written startup, shutdown, and malfunction plan eliminates the reporting requirement of 40 CFR 63.5910(c)(4).

The reporting requirements of 40 CFR 63.5910(c)(6) does not apply because the facility does not operate a continuous monitoring system.

The facility is not in the business of coating metal parts and products; as a result, the facility is not subject to the NESHAP for Surface Coating of Miscellaneous Metal Parts and Products, Subpart MMMM.

Attachment 1

Magnum Industries, Inc
New Gel-Coat Application Technology
Emission Testing

Magnum Industries, Inc.

New Gel-Coat Application Technology Emission Testing

May 30 – June 2, 2000

Emission Tests
Performed at Coating Applications Research Laboratory
(CARL)

CARL Test Engineers
S. J. Hall
J. R. Noonan

Summary Report
(Technical Revision - - November 22, 2000)
Compiled and Written
By
S. J. Hall
J. R. Noonan
July 24, 2000

Clean Manufacturing Technology and Safe Materials Institute
Purdue University
2655 Yeager Road
Suite 103
West Lafayette, In. 47906

Confidentiality Statement

Confidentiality Information:

Purdue does not desire to receive information which is confidential to Composite Technology Polymers Group. However, should it be necessary for personnel of the Coating Applications Research Laboratory (CARL) to receive such confidential information in order to perform the technical assistance needed, Purdue and its researchers agree to use their best effort to prevent the disclosure of such information furnished by Composite Technology Polymers Group, provided such confidential information is clearly indicated in writing as confidential, or given orally and reduced to writing within thirty (30) days. If requested, Purdue and Composite Technology Polymers Group will develop and sign a Confidentiality Agreement.

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Use of CMTI and/or CARL Name:

Composite Technology Polymers Group may reference in technical and research reports and documents that the Indiana Clean Manufacturing Technology and Safe Materials Institute (CMTI) and its Coating Applications Research Laboratory (CARL) located at Purdue University performed testing on products (material) supplied by Composite Technology Polymers Group.

New Gel-coat Application Technology
Emission Testing
May 30 – June 2, 2000
Magnum Industries, Inc.

From May 30 through June 2 the Magnum Company was present at the Coating Applications research Laboratory (CARL), at Purdue University, to perform a series of emission tests on a new type of application technology designed to apply gel-coat material in non-atomized form.

Gel-coat Materials Used:
The emission tests were performed using a standard type of resin material manufactured by Lilly Industrial Coating Company, product number 5784E90016, batch # EL2000050137, 38% styrene (by wt.).

Application equipment operational settings (all application equipment supplied and operated by Magnum personnel):

Tests 1, 2, 3, 4, 5
- Conventional, External Mix
- 518 tip size
- 11 to 1 pump, 70 psi
- 1.45% by weight (approx.) catalyst mix
- 20 psi catalyst atomizing air

Test 6, 7, 8, 9, 10
- Fit Technology, External Mix
- 0.025 orifice size & 25 degree angle
- 11 to 1 pump, 28 - 30 psi
- 1.45% by weight (approx.) catalyst mix
- 18 - 20 psi (static) catalyst air pressure

All tests were performed in accordance with the following EPA methods:

- Method 204 - Temporary/permanent enclosure -- Collection of 100 % Emissions
- Method 1 - Sample and Velocity Traverse for Stationary Sources
- Method 2A - Standard Pitot Tube
- Method 25A - Determination of Total Gaseous, Organic Concentration, Using Flame Ionization Analyzer

The emissions data in this report are given as percent styrene emission as compared to the pounds of styrene applied.

Equipment Used During Test

Magnum application equipment (as noted above)
J.U.M. Engineering, Inc. flame ionization detector (FID), model 3-100
Dwyer Instrument, Inc.-2 standard-design pitot tubes, mold 160 series
Dwyer Instrument, Inc. primary standard manometer, model #424
NEC data-logging Pentium portable computer
National Instruments: LabVIEW, version 5.1 Graphical Programming Software, data acquisition software
National Instruments: LabVIEW DAQCARD AI-16XE-50 voltage to digital converter
National Instruments: SCB-68 voltage to digital interface
Dwyer Instrument, Inc. pressure transducer, model 607-4—convert inches of water pressure to linear voltage readout
Alnor Velometer series 6000—air velocity measurement instrument
Barnant temperature & relative humidity logger, model 6919000
Dwyer Instrument, Inc. temperature transducer (linear voltage readout), model 4151D
Binks standard paint booth modified for 100% emission capture
EPA method 204 temporary/permanent enclosure—collection of 100% of emissions
Sartorious scale—360 pounds maximum, 2 gram sensitivity (computer readout)
Sartorious scale—150 pounds maximum, 1 gram sensitivity
CFA certified male mold with overspray capture flange

Emission Test Procedure:

TCA-FID was calibrated via EPA certified propane gas standards prior to the beginning of each test.

Application began only after the lab had reached a VOC PPM baseline level of approximately 1-PPM (as indicated on the TCA-FID).

Gel-coat material was applied to a CFA designed, male mold surface (35.66 sq. ft. including flange but not including overspray of approximately 2 inches).

The gel-coat was applied to an approximate wet-mil thickness of 18 to 23 mils.

Typical spray time was approximately 130 to 170 seconds allowing a targeted resin deposition onto the mold surface of approximately 2.27 Kg. (5.00 lbs.). The actual spray time varied depending on the gel-coat resin flow rate from the subject application equipment.

The TCA-FID was verified and re-calibrated (if required) via EPA certified propane gas standards at the end of each test. The calibration drift of the TCA-FID was less than 5% for each of the tests. Calibration drift of less than 5% is deemed acceptable by the EPA for Method 25A emission tests.

Catalyst (initiator) ratio to resin (determined by actual weight of catalyst used) equaled 1.4% (catalyst wt./resin wt.) for all tested samples.

The gel-coat material, applied to the CFA male mold, was monitored for emissions (and data was logged every two seconds) during the entire time, from the start of the resin application process, through cure of the material. The emission test was deemed complete only when the gel-coat had cured and the emissions had returned to original baseline levels. The entire emission test process, for each of the test run, spanned approximately 45 to 70 minutes.

Test acceptance or rejection from the emission factor calculation:

Tests 1 and 2 were performed as practice trials designed for the spray operator and test participants to practice the test protocol requirements. Tests 1 and 2 were not meant to be emission factor tests and therefore, were not included in the emission factor calculation.

Test 6 was also a practice trial for the operator to acquaint himself with the new FIT technology applicator since its operation and application characteristics differed from the conventional application used in the prior set of tests. The test was not meant to be an emission factor test and therefore, it was not included in the emission factor calculation.

Test 9 was rejected from inclusion in the emission factor calculations because the gel-coat application operator inadvertently strayed from the test protocol application technique. The mold flanges received only 60% coverage with the remaining 40% receiving a "dust coat" of 4 to 6 mils of gel-coat. All other acceptable tests 3, 4, 5, 7, 8, and 10 received proper full coverage over the entire mold including the flange area as the test protocol dictated.

Please see following tables:

Table 1 – application specifications for each individual test

Table 2 – pounds resin (gel-coat) applied, pounds styrene applied, pounds and percent emitted for each test

Table 3 – emissions comparison of Conventional verses FIT technology, statistical ANOVA tests and commentary

Table 4 – application portion emissions as percent of total emissions (attached to chart 3)

Table 5 – comparison of average PPM and peak PPM of Conventional verses FIT technology (attached to chart 8, 9, 10)

Table 6 – t-test statistics analyzing the emissions test data for statistical significance

Please see following charts:

Chart 1 – Normal-Distribution graph comparing Conventional and FIT emissions for full test

Chart 2 – Normal-Distribution graph comparing Conventional and FIT emissions for only the application portions of the tests

Chart 3 – graph of application emissions portions of the tests as compared to percent of total emissions

Chart 4 – graph of PPM styrene emission traces verses time, comparing all accepted tests (tests 3, 4, 5, 7, 8, 10) for the full duration of the tests

Chart 5 – graph of PPM styrene emission traces verses time, comparing each accepted Conventional applicator test (tests 3, 4, 5)

Chart 6 – graph of PPM styrene emission traces verses time, comparing each accepted FIT applicator test (tests 7, 8, 10)

Chart 7 – graph of PPM styrene emission traces verses time, comparing all accepted tests (tests 3, 4, 5, 7, 8, 10) for the application period of the tests plus time for booth to complete 5 complete air changes after end of each application

Chart 8 – graph of PPM styrene average emission traces verses time, comparing Conventional and FIT applicators for application periods only (pauses between surface application of mold top, side, and front are cropped-out)

Chart 9 – bar chart comparing cropped, <u>average</u> PPM styrene emissions during application periods of Conventional verses FIT

Chart 10 - bar chart comparing cropped, approximate <u>peak</u> styrene emissions during application periods of Conventional verses FIT

Table 1

Test #	Catalyst % wt. Ratio	Lbs. Gel-coat Applied	Kg. Gel-coat Applied	Ave. wet-mil Thickness Applied			Est. Percent Overspray	Kg. Flow per Min.	Comments
				Top	Front	Side			
1	1.27	3.236	1.468	--	--	--	--	0.786	Initial Checkout of Conventional. Gun
2	1.20	4.852	2.201	18.00	16.67	18.50	--	0.776	Low Catalyst ratio detected
3	**1.43**	**4.888**	**2.217**	**18.67**	**16.75**	**18.75**	**13.78**	**0.786**	**1st Repl. -- Conv. Gun - Typ. O'spray**
4	**1.46**	**4.967**	**2.253**	**20.00**	**17.50**	**20.50**	**9.15**	**0.800**	**2nd Repl. -- Conv. Gun - Typ. O'spray**
5	**1.49**	**4.996**	**2.266**	**20.50**	**16.25**	**21.50**	**9.28**	**0.810**	**3rd Repl. -- Conv. Gun - Typ. O'spray**
6	1.47	4.932	2.237	19.50	18.00	19.00	--	0.951	Initial Checkout of FITgun technology
7	**1.41**	**5.516**	**2.502**	**23.50**	**18.00**	**21.50**	**11.13**	**1.009**	**1st Repl. -- FIT. Gun**
8	**1.42**	**4.912**	**2.228**	**24.50**	**16.38**	**23.00**	**0.00**	**1.027**	**2nd Repl. --FIT Gun**
9	1.39	4.996	2.266	23.86	16.75	22.50	--	1.030	Altered Application technique
10	**1.41**	**5.101**	**2.314**	**23.75**	**18.00**	**24.25**	**0.00**	**1.049**	**3rd Repl. -- FIT. Gun**

The above table contains data pertinent to all the tests performed over the three-day testing period. The comments column contains key information relative to each test run. Tests included in the performance evaluation are highlighted in bold print and the comments column identifies the "Replication" identity of each. The estimated percent overspray column is included in the table to indicate or suggest consistency of overspray beyond the mold's flange surface. The overspray calculation is based on the surface area of the mold (35.66 sq. ft.) and the wet-mil thickness readings taken across the mold's three surfaces. The Conventional and FIT apllicators were used in a manner that applied an even coat to the entire mold, including the flange surfaces. The test experience demonstrated that the FIT applicator adequately covered the mold flange with little requirement of overspray beyond the flange lip; whereas, the Conventional system required a 2 to 4 inch overspray to provide adequate flange coverage. Wet-mil thickness readings were taken for each of the Conventional and FIT application tests. The Conventional applicator provided a smooth, even gel-coat surface on which to measure coating thickness. However, the FIT application produced a more mottled, pebbled type of gel-coat surface, with numerous bumps and depressions. The thickness measurements on such an undulated surface were difficult and probably are overstated (the high spots would be detected without compensation for the low spots. It is believed that this "overestimate" for the FIT applicator is responsible for th "0%" entries for overspray for tests 8 and 10. Test personnel observed that the FIT technology required less overspray in covering the flange than did the Conventional applicator technology.

Table 2

CONVENTIONAL

Test #	Applied		Emissions		
	# Resin	# Styrene	# Styrene	% Emiss.	
3	4.8875982	1.857287	0.90194	48.56%	Full Test
			0.492129	26.50%	Appl. + 48s.(Abbreviated Data)
4	4.9669638	1.887446	0.880067	46.63%	Full Test
			0.539378	28.58%	Appl. + 48s.(Abbreviated Data)
5	4.9956236	1.898337	0.901887	47.51%	Full Test
			0.53443	28.15%	Appl. + 48s.(Abbreviated Data)
			Full test Conv. Ave.	47.57%	
			Applicaton + 48 seconds Ave.	27.74%	

FIT

	Applied		Emissions				
7	5.5159092	2.096045	0.675399	33.03%	Full Test		
			0.310462	15.18%	Appl. + 48s.(Abbreviated Data)		
8	4.911849	1.866503	0.586589	31.43%	Full Test		
			0.280122	15.01%	Appl. + 48s.(Abbreviated Data)		
10	5.101444	1.938549	0.613427	31.64%	Full Test		
			0.265387	13.69%	Appl. + 48s.(Abbreviated Data)		
			Full test FIT Ave.	32.03%	32.65%	FIT % Reduction	
			Applicaton + 48 seconds Ave.	14.63%	47.28%	FIT % Reduction	

The table above provides details of the gel-coat resin applied, its styrene content, the monitored styrene emitted and the styrene emitted as a percent of styrene applied. Full-Test values are presented as well as the values that had been attained at 48 seconds (approximately 5 booth air changes) after spray application had stopped. The FIT % Reduction values are the reduction from Conventional as a percent of Conventional, e.g. (47.57 - 32.03)/47.57

Table 3
Styrene Emissions / Styrene Applied
Expressed as a Percentage

Full Emissions Comparison

Replication	Conventional	FIT	FIT vs Conv. Reduction
1	48.56%	32.22%	33.65%
2	46.63%	31.43%	32.60%
3	47.51%	31.64%	33.39%
Ave.:	47.57%	31.76%	33.22%

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Conventional	3	1.426989289	0.4756631	9.383E-05
FIT	3	0.952933486	0.3176445	1.691E-05

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.037454817	1	0.0374548	676.43292	1.298E-05	7.708649719
Within Groups	0.000221484	4	5.537E-05			
Total	0.037676302	5				

Application + 48 Seconds Comparison

Replication	Conventional	FIT	FIT vs Conv. Reduction
1	26.50%	14.81%	44.10%
2	28.58%	15.01%	47.48%
3	28.15%	13.69%	51.37%
Ave.:	27.74%	14.50%	47.72%

Anova: Single Factor

SUMMARY

Groups	*Count*	*Sum*	*Average*	*Variance*
Conventional	3	0.832268318	0.2774228	0.0001208
FIT	3	0.435096223	0.1450321	5.056E-05

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.026290945	1	0.0262909	306.89636	6.234E-05	7.708649719
Within Groups	0.000342669	4	8.567E-05			
Total	0.026633614	5				

The information above lists the percent emissions observed from three test replications for conventional gun application and three for the FIT gun. Below are ANOVA tabulations for Full-test data and "Abbreviated" data. For each, an *"F" value* is determined which is greater than the corresponding *"F-Critical" value*, from which we can infer that the different gun technologies do perform differently. The *"P-value"*s indicate that we can be more than 99.99% sure of this. Sample Estimated Normal Distribution Curves (Charts 1&2) are provided for visual reference. Note: This does not mean that we are that sure how different the population means are from each other, only that they are different. See additional data analyses in Table 6 for "difference" statistics comparisons.

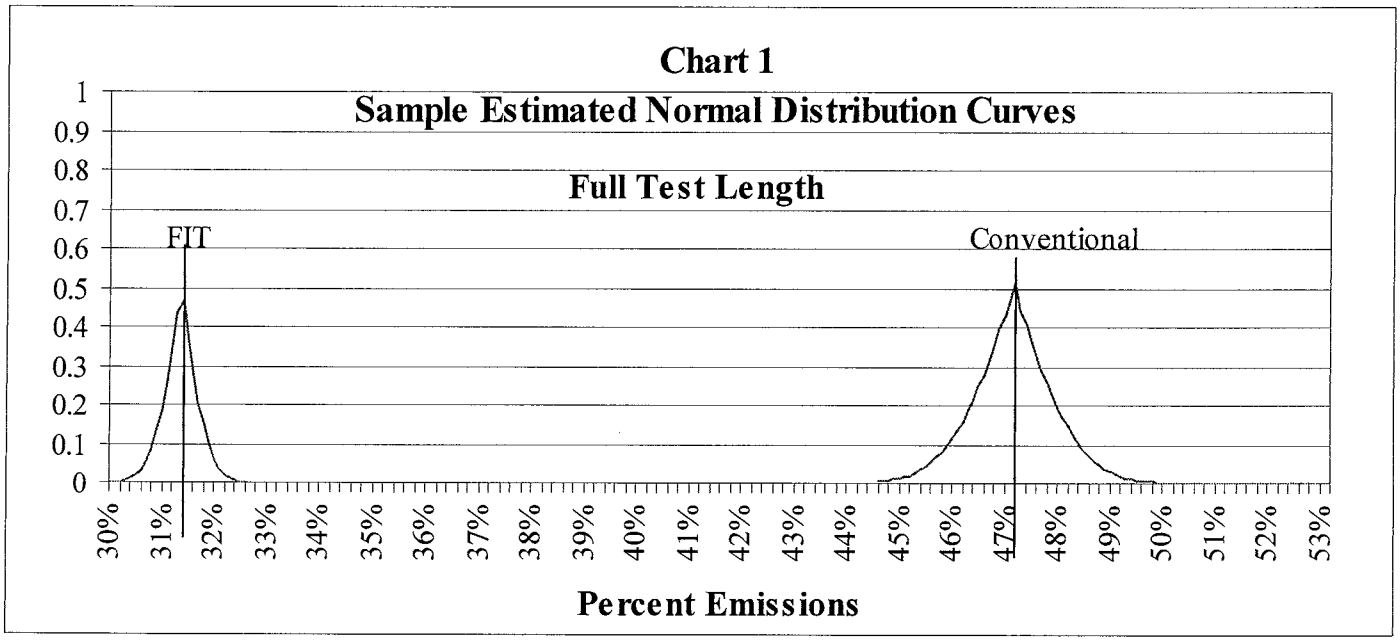


Chart 1
Sample Estimated Normal Distribution Curves
Full Test Length
FIT
Conventional
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
30%
31%
32%
33%
34%
35%
36%
37%
38%
39%
40%
41%
42%
43%
44%
45%
46%
47%
48%
49%
50%
51%
52%
53%
Percent Emissions

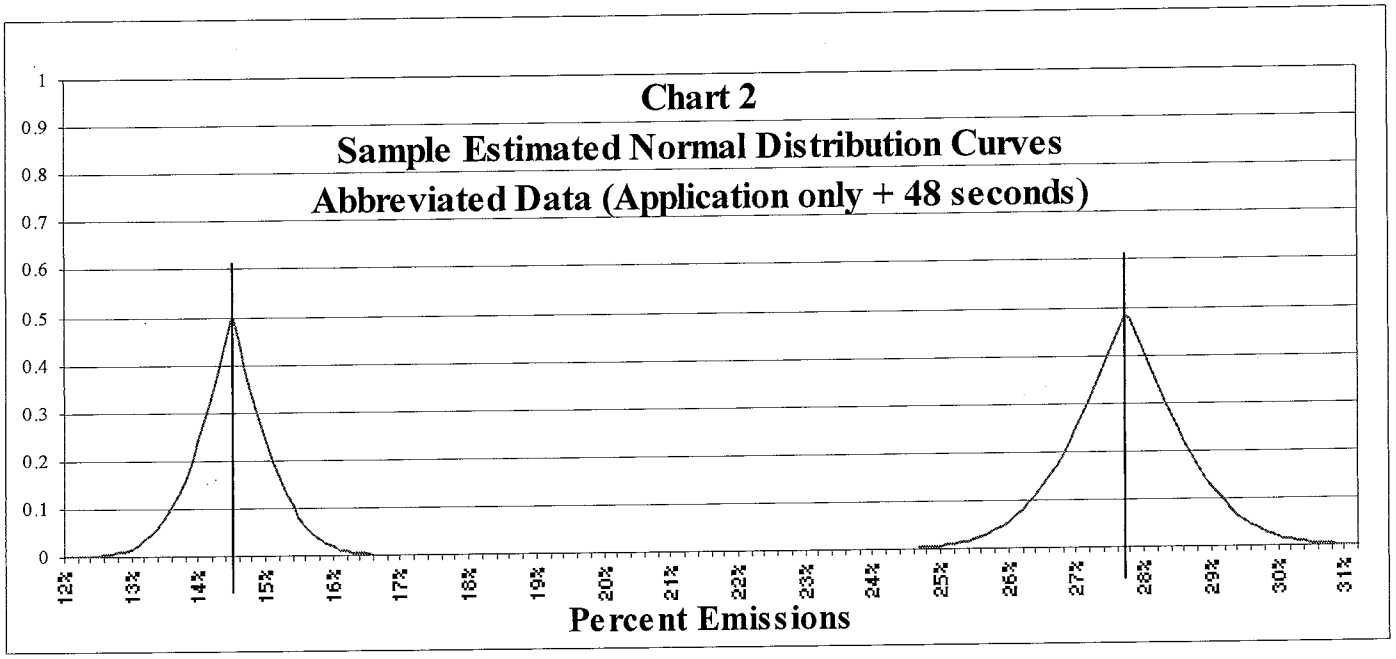
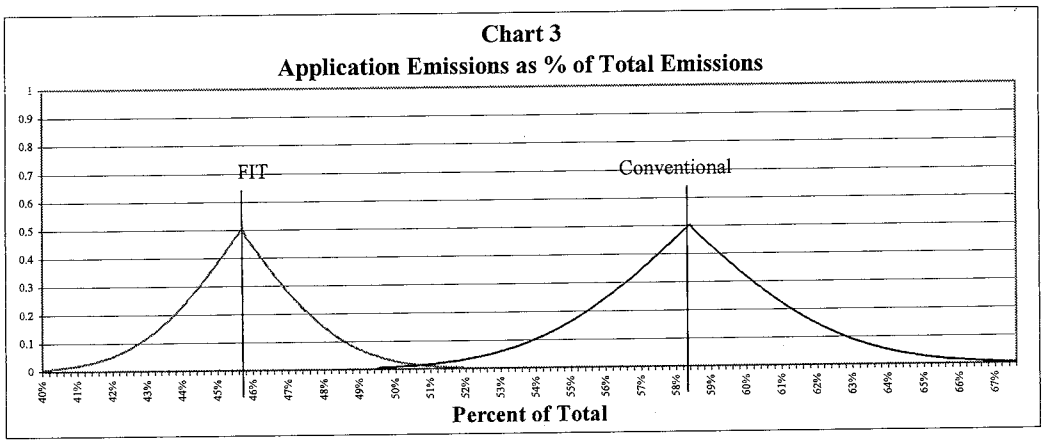


Table 4

T#	Emissions: Appl.+48s % of Total Convent'l	Emissions: Appl.+48s % of Total FIT	T#
3	54.56%	45.97%	7
4	61.29%	47.75%	8
5	59.26%	43.26%	10
Ave.	***58.37%***	***45.66%***	Ave.



The data above represent a comparison of the "Abbreviated"emissions (Application Only plus 48 seconds) that occurred for each test compared to its related "Full Test" emissions, expressed as a percent. On the average 58.37% of the emissions occurred from Application with the Conventional gun; whereas, 45.66% of the total emissions occurred during Application with the FIT gun. Sample Estimated distributions are provide on Chart 3 and suggest that there can be a lot of variation. However, the two distributions are clearly separated. It should be noted that this abbreviated test still contains non-spray time that varies substantially, one test to another. This time is the time between applications to the different surfaces of the mold when wet-mil thickness was being checked. Additional information is provided in this report (Table 5, Chart 8) to depict "Cropped" data - (i.e. the abbreviated test with the non-spray periods cropped out as an approximation to what a continuous, uninterrupted spray to the complete mold surface would have been like.

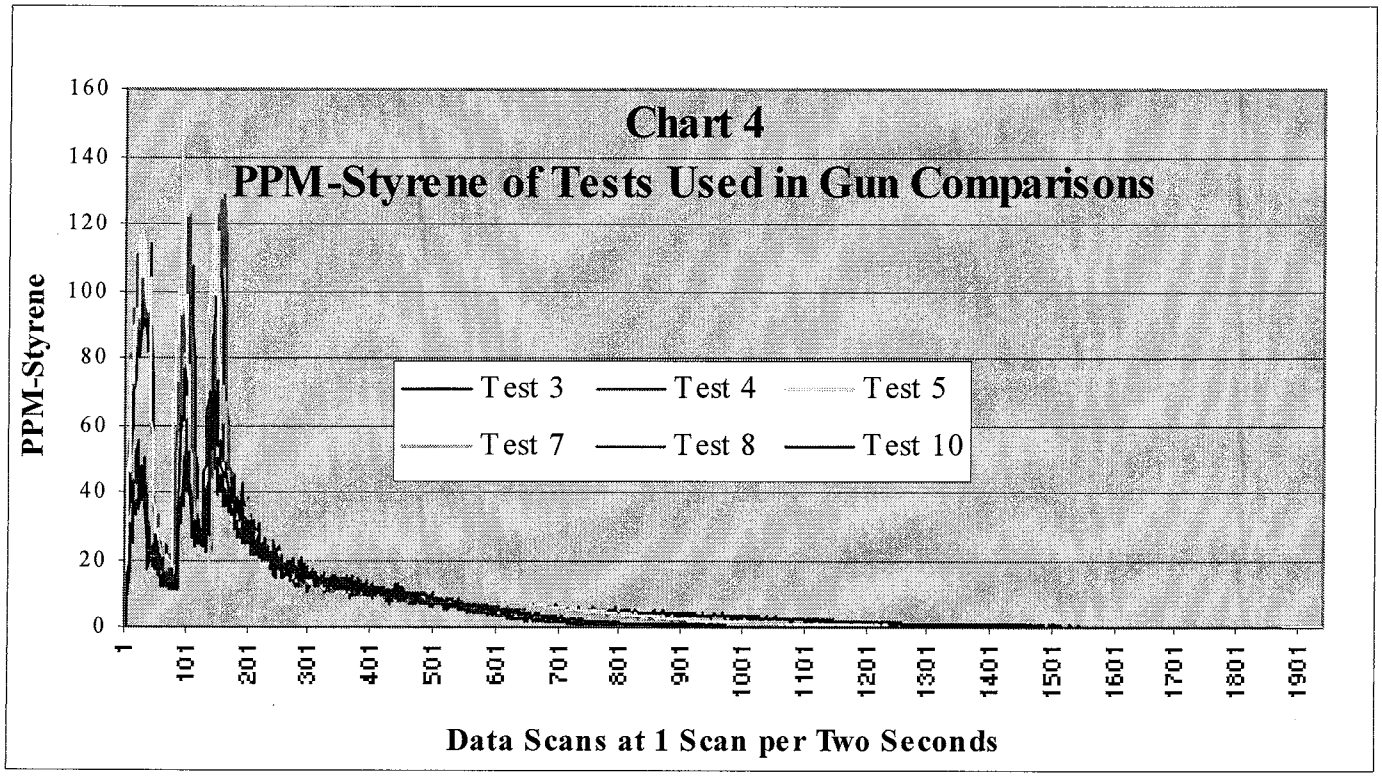


Chart 4
PPM-Styrene of Tests Used in Gun Comparisons
PPM-Styrene
160
140
120
100
80
60
40
20
0
Test 3
Test 4
Test 5
Test 7
Test 8
Test 10
1
101
201
301
401
501
601
701
801
901
1001
1101
1201
1301
1401
1501
1601
1701
1801
1901
Data Scans at 1 Scan per Two Seconds

Chart 5
Conventional Test Emissions

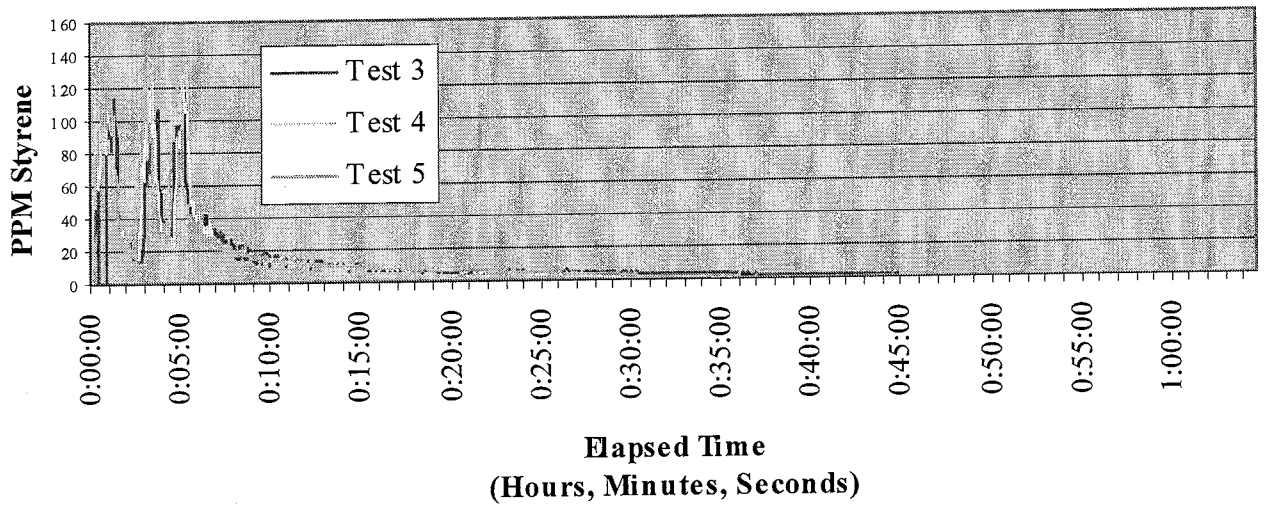


Chart 6
FIT Test Emissions

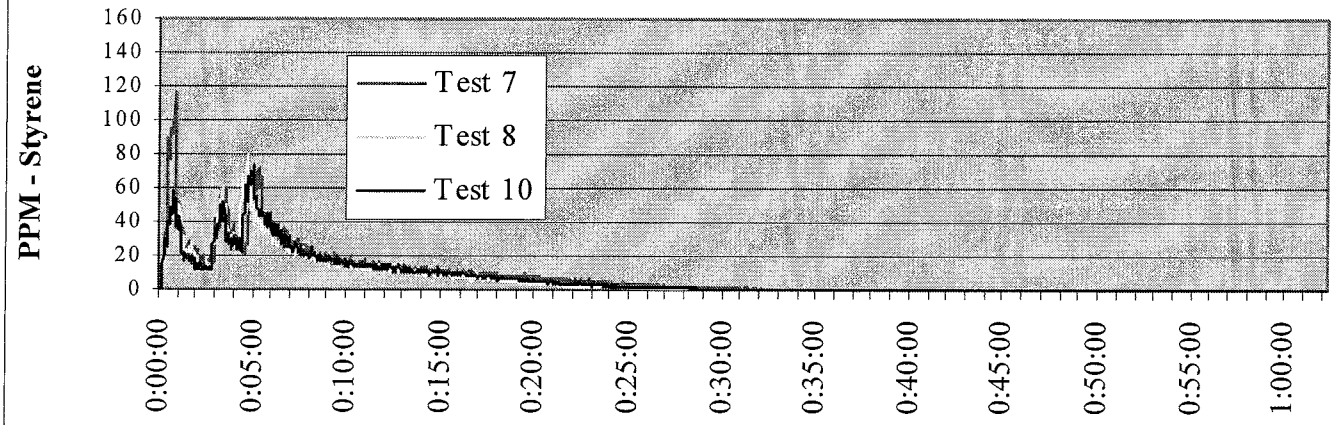
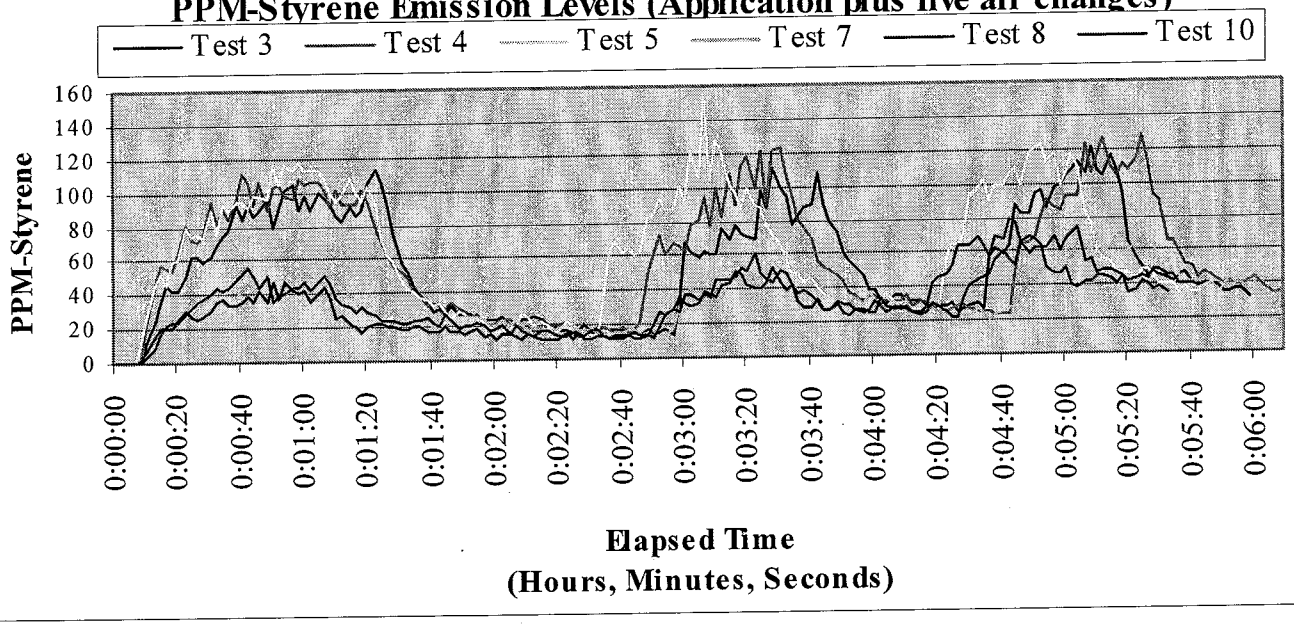


Chart 7

PPM-Styrene Emission Levels (Application plus five air changes)



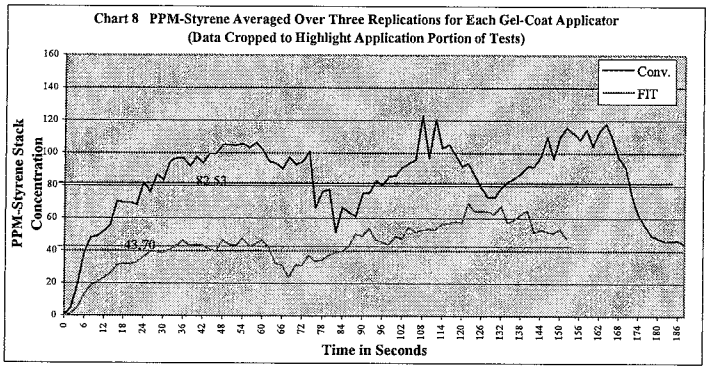
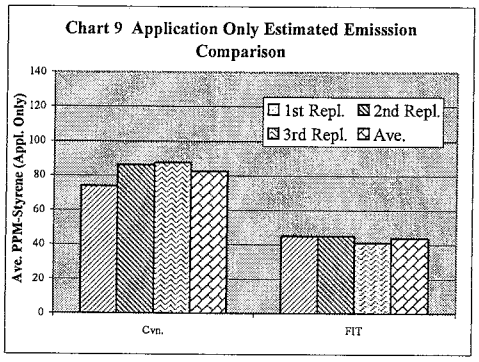
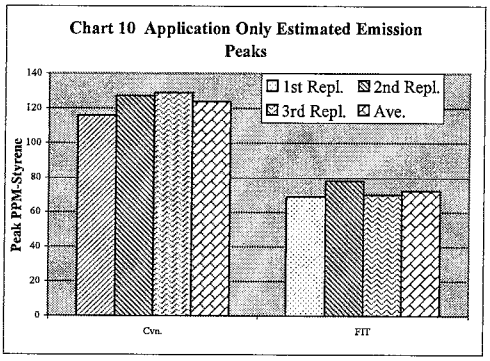


Table 5
Abbreviated, Cropped Test Data

	Averages			Peaks	
	Cvn.	FIT		Cvn.	FIT
1st Repl.	73.97497	44.9631	1st Repl.	115.91	68.97
2nd Repl.	86.09201	45.00259	2nd Repl.	126.98	78.22
3rd Repl.	87.53274	41.11959	3rd Repl.	128.81	70.17
Ave.	82.53324	43.6951	Ave.	123.9	72.45333





The above table and charts display information relative to the application period of the tests, only. The data has been abbreviated to drop all data following the basic application of gel-coat, and further, has had the emission data from the non-application delays between mold surfaces (for wet-mil thickness checks) removed. This gives an approximation of what a continuous application to all surfaces, without interruption, would be like. The average emission level for this period was 82.5 ppm styrene for Conventional and 43.7 ppm styrene for FIT application. Similarly, the approximate sustained peak for the Conventional gun was 123.9 ppm and 72.5 ppm for the FIT application. Stack airflow was approximately 5900 acfm.

Table 6

t-Test: Two-Sample Assuming Equal Variances

Alpha = .00002 — 99.998% conf.

	Conventional	*FIT*
Mean	0.475663	0.317644
Variance	9.38E-05	1.69E-05
Observations	3	3
Pooled Variance	5.54E-05	
Hypothesized Mean Difference	0	
df	4	
t Stat	26.00832	
P(T<=t) one-tail	6.49E-06	
t Critical one-tail	10.9151	
P(T<=t) two-tail	1.3E-05	
t Critical two-tail	13.03852	

t-Test: Two-Sample Assuming Equal Variances

Alpha = .5

	Conventional	*FIT*
Mean	0.475663	0.317644
Variance	9.38E-05	1.69E-05
Observations	3	3
Pooled Variance	5.54E-05	
Hypothesized Mean Difference	0.158	
df	4	
t Stat	0.003062	
P(T<=t) one-tail	0.498852	
t Critical one-tail	2.84E-07	
P(T<=t) two-tail	0.997704	
t Critical two-tail	0.740697	

t-Test: Two-Sample Assuming Equal Variances

Alpha = .02

	Conventiona	*FIT*
Mean	0.475663	0.317644
Variance	9.38E-05	1.69E-05
Observations	3	3
Pooled Variance	5.54E-05	
Hypothesized Mean Difference	0.15	
df	4	
t Stat	1.319784	
P(T<=t) one-tail	0.128686	
t Critical one-tail	0.740697	
P(T<=t) two-tail	0.257373	
t Critical two-tail	1.344397	

t-Test: Two-Sample Assuming Equal Variances

	Conventiona	*FIT*
Mean	0.475663	0.317644
Variance	9.38E-05	1.69E-05
Observations	3	3
Pooled Variance	5.54E-05	
Hypothesized Mean Difference	0.135	
df	4	
t Stat	3.788638	
P(T<=t) one-tail	0.009646	
t Critical one-tail	2.776451	
P(T<=t) two-tail	0.019292	
t Critical two-tail	3.495406	

In testing differences we use "t-Test" statistics. The upper test statistics are for a comparison of the Conventional verses FIT applications, using the basic premise that they have the same mean value (I.e. the Hypothesized Mean Difference = 0). The t-Test indicates, as did the ANOVA test, that they are not the same. The "*t Stat* istic"of 26.008 exceeds the "*t Critical two-tail* "value with 99.998 % confidence (1 minus an alpha of .00002). The difference in average sample means was 15.8% (.158). If we plug this number into the *Hypothesized Mean Difference* in the lower left-hand t-Test set, we find that the *t Stat* is extremely smaller than the *t Critical two-tail* value, even at the 50 % confidence level (1 minus an alpha of .5). Proceeding to the central t-Test set and lowering our *Hypothesized Mean Difference to 15%,* we find that we are nearly 80% confident of a difference that great, and in the rightmost t-Test set we see that we are over 97.5% confident that there is a difference of at least 13.5%.

Attachment 2

NESHAP Subpart WWWW Regulatory Review

Attachment 2
NESHAP Subpart WWWW Regulatory Review

This appendix describes the regulatory analysis of the applicable NESHAP rule.

40 CFR 63, Subpart WWWW National Emission Standards for Hazardous Air Pollutants for Reinforced Plastic Composites Production

This subpart establishes national emissions standards for hazardous air pollutants (NESHAP) for reinforced plastic composites production. This subpart also establishes compliance options, operating requirements, and work practice requirements to demonstrate initial and continuous compliance with the hazardous air pollutants (HAP) emissions standards for open molding, polymer casting, mixing, and cleaning of equipment procedures used in reinforced plastic composites manufacture. The requirements of this subpart apply to this facility because the facility-wide HAP emissions of the facility exceed major source thresholds.

40 CFR 63.5785(a) Am I subject to this subpart?

The requirements of this subpart apply to this facility because the facility owns or operates a reinforced plastic composites production facility that is located at a major source of HAP emissions.

40 CFR 63.5787 What if I also manufacture fiberglass boats or boat parts?

40 CFR 63.5787(a) applies because the source meets the applicability criteria in 40 CFR 63.5785, and is not subject to the Boat Manufacturing NESHAP (40 CFR Part 63, subpart VVVV). The requirements of 40 CFR 63.5785(b) through (d) do not apply because the facility is not subject to the Boat Manufacturing NESHAP (40 CFR part 63, subpart VVVV).

40 CFR 63.5790 What parts of my plant does this subpart cover?

In accordance with 40 CFR 63.5790(a), the facility is subject to this subpart because it is a new or existing facility. In accordance with 40 CFR 63.5790(b), the affected sources located at the facility are open molding, mixing, cleaning of equipment used in reinforced plastic composites manufacture, HAP-containing materials storage, and repair operations on parts the facility manufactures.

40 CFR 63.5795 How do I know if my reinforced plastic composites production facility is a new affected source or an existing affected source?

In accordance with 40 CFR 63.5795(a) and (b), the facility is an existing affected source because it began construction before August 2, 2001.

40 CFR 63.5796 What are the organic HAP emissions factor equations in Table 1 to this subpart, and how are they used in this subpart?

This section is informational.

40 CFR 63.5797 How do I determine the organic HAP content of my resins and gel coats?

In accordance with 40 CFR 63.5797, the Permittee may rely on information provided by the material manufacturer, such as manufacturer's formulation data and material safety data sheets (MSDS), using the procedures specified in 40 CFR 63.5797(a) through (c).

40 CFR 63.5798 What if I want to use, or I manufacture, an application technology (new or existing) whose organic HAP emissions characteristics are not represented by the equations in Table 1 to this subpart?

This section does not apply to the Permittee.

40 CFR 63.5799 How do I calculate my facility's organic HAP emissions on a tpy basis for purposes of determining which paragraphs of 40 CFR 63.5805?

In accordance with 40 CFR 63.5799, the facility is a "existing" facility, and must use the procedures in either paragraph (b)(1) or (2) of this section to calculate the facility's organic HAP emissions in tpy for purposes of determining which paragraphs in 40 CFR 63.5805 apply to the facility.

40 CFR 63.5800 When do I have to comply with this subpart?

In accordance with 40 CFR 63.5800, the Permittee must comply with the standards in this subpart by the dates specified in Table 2 to this subpart. For an existing source, the date specified in Table 2 is April 21, 2006. The Permittee has organic HAP emissions standard based on a 12-month rolling total, and, therefore, must begin collecting data on the compliance date in order to demonstrate compliance.

40 CFR 63.5805 What standards must I meet to comply with this?

40 CFR 63.5805(a), (a)(1), and (a)(2) of (a) do not apply to the facility because it does not have any centrifugal casting or continuous casting/lamination operations. In accordance to 40 CFR 63.5805(b) the Permittee must meet the organic HAP emissions limits in Table 3 to this subpart and the work practice standards in Table 4 to this subpart that apply, regardless of the quantity of HAP emitted. The requirements of 40 CFR 63.5805(c) through (g) do not apply because the facility is not a new source nor is it a existing source subject to the provisions of (a)(2) or (c) of the subpart. 40 CFR 63.5805(h) does not apply because the facility does not use an add-on control device to comply with this subpart.

40 CFR 63.5810 What are my options for meeting the standards for open molding and centrifugal casting operations at new and existing sources?

The facility must use one of the methods in 40 CFR 63.5810 paragraphs (a) through (d) to meet the standards for open molding in Table 3 of this subpart.

40 CFR 63.5820 What are my options for meeting the standards for continuous lamination/casting operations?

Paragraphs (a) through (d) of this section do not apply to the facility because the facility has open molding operations, and is not subject to the standards continuous lamination/casting operations.

40 CFR 63.5830 What are my options for meeting the standards for pultrusion operations subject to the 60 weight percent organic HAP emissions reductions requirement?

40 CFR 63.5830 and paragraphs (a) through (d) of the section do not apply to the facility because the facility has open molding operations, and is not subject to the standards for pultrusion operations subject to the 60 weight percent organic HAP emissions reductions requirement.

40 CFR 63.5835 What are my general requirements for complying with this subpart?

Paragraph (a) of this section applies to the facility and requires the facility to be in compliance at all times with the work practice standards in Table 4 and the organic HAP emissions limits in Table 3. Paragraph (b) of this section does not because the facility does not use add-on controls. Paragraphs (c) and (d) of 40 CFR 63.5835 generally apply to all facilities subject to 40 CFR 63, Subpart WWWW.

40 CFR 63.5840 By what date must I conduct a performance test or other initial compliance demonstration?

The facility must comply with the data collection and compliance demonstration requirements of this paragraph by the compliance date specified by 40 CFR 63.5800. Because the facility is an open molding operation that elected to meet a organic HAP emissions limit on a 12-month rolling total, the facility must initiate collection of the required data on the compliance date, and demonstrate compliance 1 year after the compliance date.

40 CFR 63.5845 When must I conduct subsequent performance tests?

This section does not apply to the Permittee because it does not operate an add-on control device to meet a standard.

40 CFR 63.5850 How do I conduct performance tests, performance evaluations, and design evaluations?

This section does not apply to the Permittee because these requirements apply to facilities that operate an add-on control device to meet a standard.

40 CFR 63.5855 What are my monitor installation and operation requirements?

This section does not apply to the Permittee because these requirements apply to facilities that operate an add-on control device to meet a standard.

40 CFR 63.5860 How do I demonstrate initial compliance with the standards?

Paragraph (a) of this section applies to the facility and requires the facility demonstrate initial compliance with each applicable organic HAP emissions standard in 40 CFR 63.5805 paragraphs (a) through (h) by using the procedures shown in Tables 8 and 9 of this subpart. Specifically, only item 1 of Table 8 applies, and item 3 of Table 9 apply. Paragraph (b) of this section does not apply to the Permittee because these requirements apply to facilities that operate an add-on control device to meet a standard.

40 CFR 63.5865-5890 What data must I generate to demonstrate compliance with the standards for continuous lamination/casting operations?

This section does not apply to the Permittee because these requirements apply to facilities that have continuous lamination/casting operations. The facility has open molding operations.

40 CFR 63.5895 How do I monitor and collect data to demonstrate continuous compliance?

Paragraph (a) of this section does not apply to the Permittee because this requirement applies to facilities that operate an add-on control device to meet a standard. Paragraphs (b), (b)(1) through (b)(3), (c) and (d) of this section apply. Paragraph (4) is informational. Paragraph (e) of this section does not apply to the Permittee because this requirement applies to facilities that operate pultrusion machines.

40 CFR 63.5900 How do I demonstrate continuous compliance with the standards?

Paragraph (a)(1) and (d) of this section do not apply to the Permittee because these requirements apply to facilities that operate an add-on control device to meet a standard. Paragraphs (a)(2) through (a)(4), (b), (c) and (e) of this section apply.

40 CFR 63.5905 What notifications must I submit and when?

Paragraphs (a) and (b) of this section apply. The facility is subject to the initial notification requirements for existing sources under Table 13.

40 CFR 63.5910 What reports must I submit and when?

Paragraphs (a), (b), (b)(1) through (b)(5), (c), (c)(1) through (c)(5), (h), (i) and (g) of this section apply. Paragraphs (c)(6), (e), and (e)(1) through (e)(12) do not apply because the facility does not operate a continuous monitoring system. Paragraph (f) does not apply because 40 CFR 63.5805(a)(1) and (d).

40 CFR 63.5915 What records must I keep?

Paragraphs (a), (a)(1) through (3), (c), and (d) of this section apply. Paragraphs (b) of this section does not apply to the Permittee because this requirement applies to facilities that operate an add-on control device, which the Permittee does not. Paragraphs (e)(1) through (4) of this section do not apply because the facility does not have new or existing continuous lamination/ casting operations.

40 CFR 63.5920 In what form and how long must I keep my records?

Paragraphs (a) through (d) of this section apply.

40 CFR 63.5925 What parts of the General Provisions apply to me?

This section and Table 15 of Subpart WWWW, applies to this facility as specified.

40 CFR 63.5930 Who implements and enforces this subpart?

This section does not apply to the facility.

40 CFR 63.5935 What definitions apply to this subpart?

The definitions of this section apply to the facility.