KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

KA 525-98-02

February 15, 1999

RECEIVED
FEB 16 1999
BUREAU OF
AIR REGULATION

Ms. Rita Felton-Smith, P.E.
Florida Department of
Environmental Protection
Northeast District
7825 Baymeadows Way, Suite B200
Jacksonville, FL 32256-7590

SUBJECT: Submittal of Additional Information
Monterey Boats - Williston Cruiser Plant
File No. 0750033-001-AC

Dear Ms. Felton-Smith:

This is in response to your letter dated December 15, 1998, requesting additional information on the above project. The responses are in the order of the questions.

Response 1: A detailed description of the proposed process and operations is presented in Attachment 1.

Response 2: A description of the wood materials processing is included in Attachment 1. A dust collector (drawing attached) is being proposed to control particulate matter emissions from the wood working equipment. The particulate matter emissions to the atmosphere, based on a conservative assumption of an exit loading of 0.02 gr/cf and continuous operation, can be estimated as follows:

PM = 5000 cfm x 0.02 gr/cf x lb/7000 gr x 60 min/hr
= 0.9 lb/hr
x 8760 hrs/yr x ton/2000 lbs
= 3.8 tpy

Given this level of particulate matter emissions, it is expected that the wood working area at the proposed facility will be considered an insignificant emission unit.

Response 3: The facility's nearest neighbors are the airport facility and some residences, the nearest of which is about 300 yards from the proposed site. It is anticipated that odors from the proposed operation will not be at objectionable levels, based on a comparison of the size, configuration and layout of the proposed facility to other existing facilities operated by Seabring Marine.

The odors, resulting from the use of VOC containing materials, will be controlled by closing containers not in use; attending to VOC spills quickly; and, properly disposing of wastes.

Response 4: A proposed MACT, along with reference to similar sources, is presented in Attachment 1. It should be noted that there was a mixed agency feedback concerning the applicability of MACT for this facility because the emission unit (equipment) is simply being relocated to a new site, not undergoing new equipment installation. The 112(g) preamble indicates that such relocation of existing equipment was not intended to be subject to new source MACT requirements. The 112(g) rule language, however, is not detailed enough on the definition of "construction" to clarify that intent. It is our understanding that EPA clarification of this issue is not expected anytime soon. Therefore, in the interest of expediting the permitting of the project, the applicant has provided the requested MACT analysis, regardless of whether it is applicable or not.

The MSDS information requested is presented in Attachment 2.

We would appreciate your prompt review of the subject permit application. If you have any further questions, please call Pradeep Raval or me.

Very truly yours,

KOOGLER & ASSOCIATES

John B. Koogler, Ph.D., P.E.

JBK:par
Encl.

c: F.J. Gombash, Monterey Boats
C. Phillips, FDEP Tallahassee

ATTACHMENT 1

CASE-BY-CASE MACT DETERMINATION

MONTEREY BOATS - WILLISTON CRUISER PLANT

Introduction

Section 112(g) of the Clean Air Act requires that Maximum Achievable Control Technology (MACT) be applied to new major sources of Hazardous Air Pollutants (HAPs) constructed prior to EPA's promulgation of final MACT standards for the source category.

Monterey Boats proposes to relocate production equipment from the existing fiberglass boat manufacturing facility in Archer to a new facility in Williston, Florida. The HAP emissions from the new facility, primarily styrene, are expected to be above the major source threshold. Consequently, a case-by-case MACT determination is required, as EPA has not finalized the MACT standards for this source category.

Process Description

The proposed facility will manufacture cruisers, beginning with the molding of all cruiser components and ending with finished product, using the open mold process. Separate molds will be used for the boat hull, deck and other miscellaneous small fiber reinforced plastic parts.

To begin a gel coat, containing styrene, will be applied to a waxed mold surface. This phase of the production takes place inside a booth similar to a paint spray booth. After the gel coat hardens, chopped fiber strands and styrene containing resin, with internally mixed catalyst, will be applied by a flow coater (non-atomizing internal mix equipment). The parts will continue to be built on or inside the molds using glass roving, cloth, mat, etc. For each layer, the fiberglass substrate will be saturated with the thermosetting liquid polyester resin mixed with a catalyst until the desired thickness is achieved. The catalyzed resin will form a rigid shape consisting of fiberglass reinforced resin.

The preparation for assembly will include trimming, to eliminate sharp fibers and the trim flange, and the application of an interior grade gel coat, for certain visible areas. Flotation foam will be injected into closed cavities in the hulls. The installation of electrical and mechanical systems, engine, hardware, upholstery, carpet, etc., will then be performed. Various adhesives, waxes, oils, paints and cleaners will be used in the assembly area.

An integrated woodshop will utilize routers, saws, drills and other industrial grade woodworking tools to make all necessary reinforcing and cabinetry. Sawdust generated by the woodworking equipment will be captured at several pick up points. The combined air flow, of about 5000 cfm, will convey the sawdust to an accumulator/dust collector. The exhaust from the dust collector will be vented to the atmosphere.

The proposed facility will be capable of manufacturing 1000-1300 units per year, depending on the size of the crafts and market demands.

Control Technology Options

At this time, there is no existing MACT determination for this source category. However, several control alternatives are discussed in EPA guidance on the subject.

- Thermal oxidizer
- Catalytic oxidizer
- Condensers
- Rotary concentrators
- Solvent recovery/oxidation
- Closed molding
- Non-spray resin application
- Low HAP material use

Add-on control equipment is currently under EPA consideration for facilities emitting over 500 tons per year of HAPs. A cost assessment of these technologies was conducted using the EPA cost spreadsheets. The resulting add-on control costs were determined to be excessive (see attached spreadsheets). The lowest calculated cost of control, associated with the Polyad system (a VOC concentrator followed by microwave regeneration of the VOCs) was about $6200 per ton of pollutant removed. The actual cost would be much more, based on a current equipment cost proposal on the Polyad system, of $3.5 million. The cost amounts to a 20 percent increase since the EPA factors were generated a few years ago. Given the excessive costs, the add-on control technologies are not discussed in greater detail herein.

Closed molding is a fabrication technique in which reinforced plastic parts are produced between the halves of a two-part mold or between a mold and flexible membrane. This technique includes four types of operations: vacuum bagging; vacuum-assisted resin transfer molding; resin transfer molding; and, compression molding with sheet molding compound. These methods are being used mostly by manufacturers of small crafts/parts. The HAP emissions are better confined using this technique resulting in estimated emission reductions of up to 50 percent over spray application. The disadvantages of these techniques include: increase in solid waste due to membrane disposal and wider flanges on parts; problems associated

with bag fitting and sealing, especially if the parts are large; bag fitting is very difficult for complex shapes; gel coat print through may occur from vacuum pressure; and, more expensive molds would be needed to withstand high molding pressures. These processes are not practical for Monterey Boats in the manufacture of cruisers, primarily due to the large part sizes.

Non-spray resin application includes four basic resin application techniques: bucket and brush; resin rollers; flow coaters; and, resin impregnators. HAP emissions are reduced compared with spray techniques by eliminating the atomization of resin. Monterey Boats proposes to use flow coaters at the proposed plant for all the production resin, resulting in up to 45 percent reduction in styrene emissions as compared to spray application. Gel coat will still be applied by atomized spray techniques as this is the only practical method of uniformly applying this surface coat to the desired specifications.

HAP emissions can also be reduced by material substitutions. Monterey Boats will implement the use of a lower styrene content resin (39 percent styrene) in most of the production resin. Only 15 percent of the resin, for specific parts, will have higher styrene content (44 percent). Furthermore, Monterey Boats will continue to investigate other lower styrene content resins introduced into the market in the future. Industry representatives have indicated several potential problems with low styrene resins: reduced physical performance due to less cross-linking polyester molecules; weaker secondary bonding; more difficult application due to higher material viscosities; difficulty in wetting out traditional reinforcements; and, susceptibility to osmotic blistering with prolonged exposure to water.

At this time there are some new resins on the market with 35 percent styrene content. However, these products would need to be demonstrated in the field for structural strength and integrity for a period of at least five years (corresponding to the boat manufacturer's warranty). It would cause immeasurable harm if a switch to an unproven low styrene resin resulted in structural failures in the boats.

This technology selection is in line with other similar size boat manufacturers such as Sport-Craft, Wellcraft and Sea Ray, to name a few.

Conclusion

Monterey Boats proposes the use of flow coaters for resin application, along with the use of lower styrene content resin (39 percent) as MACT for the proposed Williston cruiser plant. Use of 44 percent styrene content resin will be limited to 15 percent of the total production resin.

Cost spreadsheet for the rotary concentrator	
PARAMETER	***INPUT***
Flowrate (cfm)	140,000
Control device input mass (tons/year)	143
Concentration (ppm)	28
Facility operating schedule (hours/year)	4160
Thermal oxidizer temperature (F)	1450
Fuel cost, ($/million BTU)	4.5
Electricity cost, ($/kwhr)	0.06
COST CALCULATIONS	
Heat recovery (%)	60
Electrical power (kW)	102
Fuel usage (Btu/hr)	7,426,645
Equipment cost (EC), (Durr budgetary costs, 3/15/96)	1,402,289
Equipment Cost (EC), (CE equip. cost index, July 1995 dollars)	1,399,021
Total Direct Cost (TDC), ($)	2,509,473
Total Capital Investment (TCI), ($)	3,029,909
Direct operating costs, minus utilities ($/year)	127,750
Thermal incinerators fuel cost ($/year)	139,027
Electrical cost ($/year)	33,811
Overhead, property tax, insurance, administration ($/year)	197,846
Capital recovery cost ($/year)	441,427
Styrene recovery cost ($/year)	0
Total annualized cost ($/year)	939,862
Cost per unit pollutant removed ($/ton)	6,918

	A	B	C	D	E	F	G
1	Cost spreadsheet for condensors						
2	***PARAMETER***	***INPUT***	***CALC.***				
3	Flowrate (cfm)	140,000	140,000				
4	Control device input mass (tons/year)	143	143.00				
5	Concentration (ppm)	28	28				
6	Facility operating schedule (hours/year)	4160					
7	Electricity cost, ($/kwhr)	0.06					
8	Styrene recovery value, ($/lb)	0.42					
9							
10	***COST CALCULATIONS***						
11							
12	Number of stages	Single	Multiple				
13	Operating temperature (F)	-10	-40				
14	Outlet concentration (ppm)	357	84				
15	Removal efficiency (%)	-1175	-199				
16	Tons of cooling	1,667	2,045				
17	Electrical power (kW)	3,334	4,090				
18							
19	Equipment cost (EC), (Chemical engineering, August 1995)	1,121,559	2,214,607				
20	Equipment Cost (EC), (CE equip. cost index, July 1995 dollars)	1,121,559	2,214,607				
21	Total Direct Cost (TDC), ($)	2,076,631	3,781,787				
22	Total Capital Investment (TCI), ($)	2,493,851	4,605,621				
23							
24	Direct operating costs, minus utilities ($/year)	228,560	88,560				
25	Electrical cost ($/year)	832,109	1,020,807				
26	Overhead, property tax, insurance, administration ($/year)	236,890	237,361				
27	Capital recovery cost ($/year)	363,329	670,993				
28	Styrene recovery cost ($/year)	1,411,236	239,328				
29	Total annualized cost ($/year)	3,072,125	2,017,721				
30							
31	Cost per unit pollutant removed ($/ton)	Infinite	Infinite				
32							
33							
34							
35							
36							

	A	B	C	D	E	F
1	Cost spreadsheet for catalytic oxidation					
2	***PARAMETER***	***INPUT***	***CALC.***			
3	Flowrate (cfm)	140,000	140,000			
4	Control device input mass (tons/year)	143	143.000			
5	Concentration (ppm)	28	28			
6	Facility operating schedule (hours/year)	4160				
7	Catalytic oxidizer temperature (F)	625				
8	Fuel cost, ($/million BTU)	4.5				
9	Electricity cost, ($/kwhr)	0.06				
10						
11	***COST CALCULATIONS***					
12	Heat recovery (%)	0	35	50	70	95
13	Electrical power (kW)	164	273	382	573	601
14	Fuel usage (Btu/hr)	93,579,139	60,435,420	46,230,969	27,291,702	3,617,617
15						
16	Equipment cost (EC), (Vendor quotes, July 1995 dollars for HR=95%)	722,452	518,539	898,551	1,008,164	2,300,000
17	Equipment Cost (EC), (CE equip. cost index, July 1995 dollars)	826,514	593,230	1,027,979	1,153,381	2,300,000
18	Total Direct Cost (TDC), ($)	1,616,362	1,252,438	1,930,647	2,126,274	3,915,000
19	Total Capital Investment (TCI), ($)	1,923,826	1,473,120	2,313,055	2,555,332	4,770,600
20						
21	Direct operating costs, minus utilities ($/year)	88,560	88,560	88,560	88,560	88,560
22	Thermal incinerators fuel cost ($/year)	1,751,801	1,131,351	865,444	510,901	67,722
23	Electrical cost ($/year)	40,884	68,141	95,397	143,096	149,910
24	Overhead, property tax, insurance, administration ($/year)	130,089	112,061	145,658	155,349	243,960
25	Capital recovery cost ($/year)	280,282	214,619	336,989	372,286	695,029
26	Total annualized cost ($/year)	2,291,617	1,614,731	1,532,048	1,270,192	1,245,180
27						
28	Cost per unit pollutant removed ($/ton)	16,869	11,886	11,277	9,350	9,166

	A	B	C	D	E	F	G
1	Cost spreadsheet for thermal oxidation						
2	***PARAMETER***	***INPUT***	***CALC.***				
3	Flowrate (cfm)	140,000	140,000				
4	Control device input mass (tons/year)	143	143				
5	Concentration (ppm)	28	28				
6	Facility operating schedule (hours/year)	4160					
7	Thermal oxidizer temperature (F)	1450					
8	Fuel cost, ($/million BTU)	4.5					
9	Electricity cost, ($/kwhr)	0.06					
10							
11	***COST CALCULATIONS***						
12	Heat recovery (%)	0	35	50	70	95	
13	Electrical power (kW)	109	218	328	519	547	
14	Fuel usage (Btu/hr)	233,838,527	151,604,023	116,360,664	69,369,518	10,630,586	
15							
16	Equipment cost (EC), (OAQPS Manual, 1988 dollars)	167,686	289,413	330,703	412,826	1,840,200	
17	Equipment Cost (EC), (CE equip. cost index, July 1995 dollars)	191,891	331,188	378,439	472,416	2,105,826	
18	Total Direct Cost (TDC), ($)	626,350	843,654	917,365	1,063,969	3,612,089	
19	Total Capital Investment (TCI), ($)	697,734	966,856	1,058,144	1,239,708	4,395,456	
20							
21	Direct operating costs, minus utilities ($/year)	88,560	88,560	88,560	88,560	88,560	
22	Thermal incinerators fuel cost ($/year)	4,377,457	2,838,027	2,178,272	1,298,597	199,005	
23	Electrical cost ($/year)	27,256	54,513	81,769	129,468	136,530	
24	Overhead, property tax, insurance, administration ($/year)	81,045	91,810	95,462	102,724	228,954	
25	Capital recovery cost ($/year)	101,653	140,861	154,161	180,613	640,374	
26	Total annualized cost ($/year)	4,675,972	3,213,771	2,598,223	1,799,962	1,293,423	
27							
28	Cost per unit pollutant removed ($/ton)	33,366	22,933	18,540	12,844	9,230	
29							

	A	B
1	Cost spreadsheet for the Thermatrix PADRE system	
2	***PARAMETER***	***INPUT***
3	Flowrate (cfm)	140,000
4	Control device input mass (tons/year)	143
5	Concentration (ppm)	28
6	Facility operating schedule (hours/year)	4160
7	Electricity cost, ($/kwhr)	0.06
8	Styrene recovery value, ($/lb)	0.42
9		
10	***COST CALCULATIONS***	
11		
12	Electrical power (kW)	99
13	Number of desorption units required	3
14		
15	Equipment cost (EC), (Purus cost sheet, 12/2/94)	3,818,000
16	Equipment Cost (EC), (CE equip. cost index, July 1995 dollars)	3,851,286
17	Total Direct Cost (TDC), ($)	6,335,006
18	Total Capital Investment (TCI), ($)	7,767,685
19		
20	Direct operating costs, minus utilities ($/year)	109,332
21	Electrical cost ($/year)	24,606
22	Overhead, property tax, insurance, administration ($/year)	376,307
23	Capital recovery cost ($/year)	1,131,674
24	Styrene recovery cost ($/year)	-114,114
25	Total annualized cost ($/year)	1,527,805
26		
27	Cost per unit pollutant removed ($/ton)	11,246

	A	B	C
1	Cost spreadsheet for the MIAB system		
2	***PARAMETER***	***INPUT***	***CALC.***
3	Flowrate (cfm)	140,000	140,000
4	Control device input mass (tons/year)	143	143
5	Concentration (ppm)	28	28
6	Facility operating schedule (hours/year)	4160	
7	Catalytic oxidizer temperature (F)	650	
8	Fuel cost, ($/million BTU)	4.5	
9	Electricity cost, ($/kwhr)	0.06	
10	Styrene recovery value, ($/lb)	0.42	
11	Replacement carbon cost ($/lb)	1.6	
12			
13	***COST CALCULATIONS***		
14			
15	Unit Type	MIAB F	MIAB C
16	Electrical power (kW)	218	218
17	Fuel usage (Btu/hr)	1,869,875	373,975
18			
19	Equipment cost (EC), (MIAB cost sheet, January 24, 1996)	1,945,000	1,991,656
20	Equipment Cost (EC), (CE equip. cost index, July 1995 dollars)	1,945,000	1,991,656
21	Total Direct Cost (TDC), ($)	3,361,200	3,433,984
22	Total Capital Investment (TCI), ($)	4,084,740	4,174,880
23			
24	Direct operating costs, minus utilities ($/year)	112,441	95,694
25	Catalytic oxidizer fuel cost ($/year)	35,004	7,001
26	Electrical cost ($/year)	54,513	54,513
27	Overhead, property tax, insurance, administration ($/year)	230,854	224,412
28	Capital recovery cost ($/year)	595,106	608,238
29	Styrene recovery cost ($/year)	0	0
30	Total annualized cost ($/year)	1,027,918	989,858
31			
32	Cost per unit pollutant removed ($/ton)	7,567	7,286

Cost spreadsheet for the Environmental C&C fluidized-bed preconcentrator		
PARAMETER	***INPUT***	***CALC.***
Flowrate (cfm)	140,000	140,000
Control device input mass (tons/year)	143	143
Concentration (ppm)	28	28
Facility operating schedule (hours/year)	4160	
Styrene recovery value, ($/lb)	0.42	
Fuel cost, ($/million BTU)	4.5	
Electricity cost, ($/kwhr)	0.06	
COST CALCULATIONS		
Recovery or oxidation?	Recovery	Oxidation
Electrical power (kW)	240	240
Fuel usage (Btu/hr)	0	0
Equipment cost (EC), (Environmental C&C quote, 4/3/96)	2,560,600	2,685,600
Equipment Cost (EC), (CE equip. cost index, July 1995 dollars)	2,570,809	2,696,307
Total Direct Cost (TDC), ($)	4,337,462	4,533,239
Total Capital Investment (TCI), ($)	5,293,803	5,536,265
Direct operating costs, minus utilities ($/year)	88,560	88,560
Thermal incinerators fuel cost ($/year)	0	0
Electrical cost ($/year)	59,904	59,904
Overhead, property tax, insurance, administration ($/year)	264,888	274,587
Capital recovery cost ($/year)	771,254	806,579
Styrene recovery cost ($/year)	-114,114	0
Total annualized cost ($/year)	1,070,492	1,229,629
Cost per unit pollutant removed ($/ton)	7,880	9,051

	A	B
1	Cost spreadsheet for biofiltration processes	
2	***PARAMETER***	***INPUT***
3	Flowrate (cfm)	140,000
4	Control device input mass (tons/year)	143
5	Concentration (ppm)	28
6	Facility operating schedule (hours/year)	4160
7	Electricity cost, ($/kwhr)	0.06
8		
9	***COST CALCULATIONS***	
10		
11		
12	Electrical power (kW)	382
13		
14	Equipment cost (EC), (Dan Boyd & Assoc, minus Emprosol)	2,285,355
15	Equipment Cost (EC), (CE equip. cost index, July 1995 dollars)	2,305,279
16	Total Direct Cost (TDC), ($)	3,923,235
17	Total Capital Investment (TCI), ($)	4,780,799
18		
19	Direct operating costs, minus utilities ($/year)	228,560
20	Electrical cost ($/year)	95,424
21	Overhead, property tax, insurance, administration ($/year)	328,368
22	Capital recovery cost ($/year)	696,515
23	Total annualized cost ($/year)	1,348,867
24		
25	Cost per unit pollutant removed ($/ton)	9,929

	A	B	C
1	Cost spreadsheet for the Polyad system		
2	***PARAMETER***	***INPUT***	***CALC.***
3	Flowrate (cfm)	140,000	140,000
4	Control device input mass (tons/year)	143	143
5	Concentration (ppm)	28	28
6	Facility operating schedule (hours/year)	4160	
7	Catalytic oxidizer temperature (F)	650	
8	Fuel cost, ($/million BTU)	4.5	
9	Electricity cost, ($/kwhr)	0.06	
10	Styrene recovery value, ($/lb)	0.42	
11			
12	***COST CALCULATIONS***		
13			
14	Electrical power (kW)	282	
15	Fuel usage (Btu/hr)	448,000	
16			
17	Equipment cost (EC), (Polyad cost sheet, July 1995)	1,488,068	
18	Equipment Cost (EC), (CE equip. cost index, July 1995 dollars)	1,488,068	
19	Total Direct Cost (TDC), ($)	2,648,386	
20	Total Capital Investment (TCI), ($)	3,201,947	
21			
22	Direct operating costs, minus utilities ($/year)	109,332	
23	Catalytic oxidizer fuel cost ($/year)	8,387	
24	Electrical cost ($/year)	70,387	
25	Overhead, property tax, insurance, administration ($/year)	193,677	
26	Capital recovery cost ($/year)	466,492	
27	Styrene recovery cost ($/year)	0	
28	Total annualized cost ($/year)	848,275	
29			
30	Cost per unit pollutant removed ($/ton)	6,244	

AMERICAN
Purification, Inc.
Regenerative Adsorption Systems

February 9, 1999

Attn: Mr. Pradeep Raval
Koogler & Associates
4014 Northwest 13th Street
Gainesville, FL 32609

REF: BUDGET PROPOSAL FOR A POLYAD™ VOC SYSTEM.

Dear Mr. Raval,

American Purification, Inc. appreciates the opportunity to provide you with the following budgetary proposal for your styrene emission project.

VOC Stream Profile

Flow Rate:	140,000 SCFM
Temperature:	80° Fahrenheit
Removal Efficiency Required:	90-95 Percent
Hours of Operation:	16 Hours/Day
Days of Operation:	7 Days/Week
Hours of Operation Per Year:	4160 Hours/Year
Contaminant(s):	
Styrene	68.22 Lbs./Hr.

VOC Loading Profile

Styrene – 95% of Mass Loading

Lbs./Hr.	68.22
Lbs./Day	1092
Lbs./Year	283,795

Other components - 5% of Mass Loading
Needs to be identified.

Polyad™ Operating Parameters

Adsorber Bed(s):	Fluidized Bed.
Adsorber Pressure Drop:	8"-10" H_2O.
Regeneration Method:	Microwave.
Regeneration Temp:	300° F.
Adsorption Media:	Bonopore™ 1120
Operating Costs:	$ 0.15 / lb.
	$ 10.23 / hr.
	$ 163.80 / day.
	$ 42,569 / yr.
Operating Cost Assumptions	
Electricity	$ 0.10/kW.
Resin Replacement	3% - 5% per yr. @ $ 0.066/gram.
Nitrogen Cost	$ 0.02/scf.

Operating costs include electricity to run microwave unit, condensers, vacuum pumps, nitrogen, and resin attrition replacement.

Not included in operating costs are, electricity for the 140,000 SCFM fans, and disposal or destruction of the Styrene.

<u>Polyad™ Budgetary Capital Costs</u>

Polyad™ **140,000 SCFM System**	**$ 3,400,000.00 U.S.**
Installation (approx.)	$ 150,000.00 U.S.

Please keep in mind this is a budgetary proposal. We can provide you with a more comprehensive proposal for this application, however we will need more detailed information with regard to stream parameters, site location, location of the system, and operating parameters at the site.

With regard to the recovered styrene, it can be disposed for the Btu value, aspirated into a thermal oxidizer for destruction, or recovered and reused. All options are viable, it primarily depends on what is ultimately best for your client.

Some of the major benefits of the ***Polyad™*** system are;

- Very low energy consumption.
- High removal efficiency, even in high humidity streams.
- Reliable, few moving parts.
- No NO_x emissions.
- No CO_2 emissions.
- Offers the opportunity to recover and reuse.
- Currently 6 ***Polyad™*** units in operation for styrene emissions.

As I mentioned to you on the phone, American Purification offers many different financing options for the ***Polyad™*** system, one of the most unique options being own & operate.

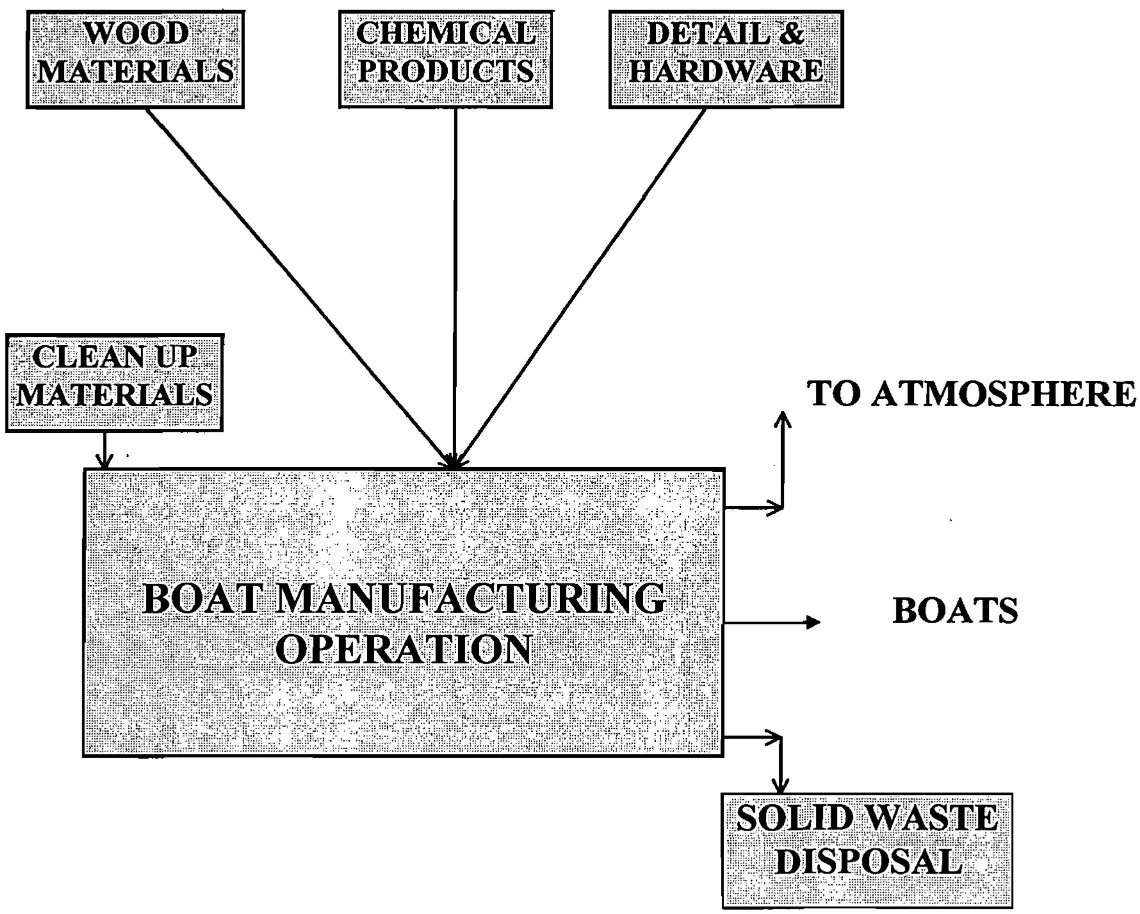
We look forward to the opportunity of working with you and your company on this project. If you have any questions or comments regarding this proposal, please call me at (888) 313-3778.

Best Regards,

Kevin L. Simpson
Vice President
American Purification, Inc.

PROCESS FLOW DIAGRAM

MONTEREY BOATS



UPDATED ATTACHMENT

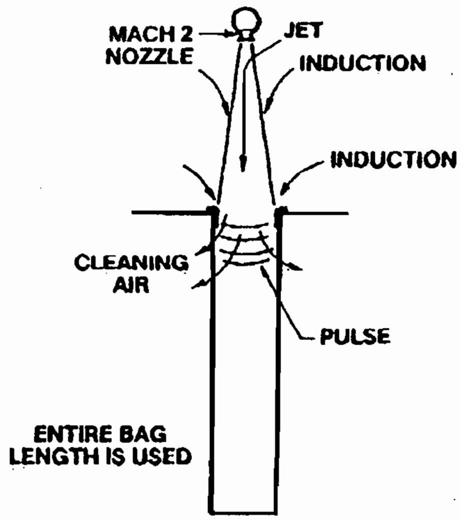
ESTIMATED MAXIMUM EMISSIONS
MONTEREY BOATS - WILLISTON CRUISER PLANT

Material	Annual Usage (lb/yr)	VOC/HAP Content	VOC Release Factor	Estimated Emissions VOC (lb/yr)	VOC (ton/yr)	HAP (ton/yr)
Acetone	400000	1.000	0.000	0.0	0.0	
Catalyst	200000	0.980	0.050	9800.0	4.9	
MEK (2%)		0.020	0.050	200.0	0.1	0.1
Cumene (2.4%)		0.024	0.050	240.0	0.1	0.1
Acetophenone (0.6%)		0.006	0.050	60.0	0.0	0.0
Contact Cement	200000	0.500	1.000	100000.0	50.0	
Gel Coat (Spray)	600000	0.550	0.540	178200.0	89.1	
Styrene (31.5%)		0.315	0.540	102060.0	51.0	51.0
Methyl Methacrylate (6%)		0.060	0.540	19440.0	9.7	9.7
Resin (Flow coater)	250000	0.440	0.120	13200.0	6.6	
Styrene (44%)		0.440	0.120	13200.0	6.6	6.6
Resin (Flow coater)	2500000	0.390	0.110	107250.0	53.6	
Styrene (39%)		0.390	0.110	107250.0	53.6	53.6
Foam A	300000	0.450	0.002	202.5	0.1	
MDI (45%)		0.450	0.002	202.5	0.1	0.1
Foam B (HFC-134a)	300000	0.000	1.000	0.0	0.0	
Vinyl Paint	70000	0.510	1.000	35700.0	17.9	
Ethyl benzene (5%)		0.050	1.000	3500.0	1.8	1.8
MEK (0.1%)		0.001	1.000	70.0	0.0	0.0
MIK (20%)		0.200	1.000	14000.0	7.0	7.0
Xylene (25%)		0.250	1.000	17500.0	8.8	8.8
Wax	1000	0.980	1.000	980.0	0.5	
Xylene (1%)		0.010	1.000	10.0	0.0	0.0
Mold Release	1000	0.980	1.000	980.0	0.5	
Xylene (60%)		0.600	1.000	600.0	0.3	0.3
Ethyl Benzene (20%)		0.200	1.000	200.0	0.1	0.1
TOTAL:					222.7	139.3

INDIVIDUAL HAP EMISSIONS	**TPY**
Acetophenone	0.0
Cumene	0.1
Diphenylmethane Diisocyanate (MDI)	0.1
Ethyl benzene	1.9
Methyl Ethyl Ketone	0.1
Methyl Isobutyl Ketone	7.0
Methyl Methacrylate	9.7
Styrene	111.3
Xylene	9.1
TOTAL	139.3

WOODSHOP ATTACHMENT

BETTER BAG CLEANING WITH MACH 2 NOZZLES



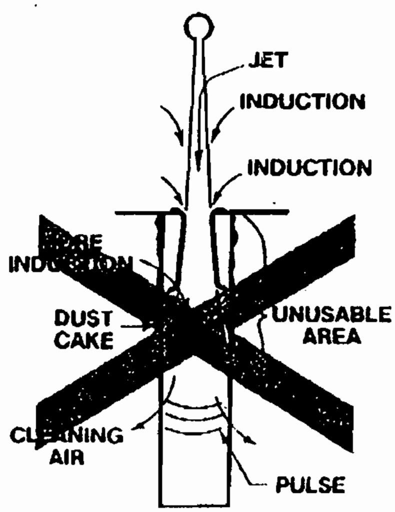
Plain orifices or straight nozzles are used in most conventional collectors that use a pulse jet cleaning system. Straight nozzles or plain orifices clean filter bags by converting the energy that's in compressed air into jets of cleaning air at sonic speed, while directing the cleaning air into each bag at a timed interval.

Scientifically shaped converging/diverging nozzles are used instead in the SPJ. They're called Mach 2 nozzles (Patent No. 4789387). They can accelerate jets of cleaning air to a speed that's much greater than sonic — to supersonic velocity!

The benefits with Mach 2 nozzles in the SPJ are substantial:

- **Air to cloth ratio goes up.**
- **Compressed air usage goes down.**
- **Pressure drop decreases.**
- **Bag life increases.**

BETTER BAG CLEANING WITHOUT VENTURIES

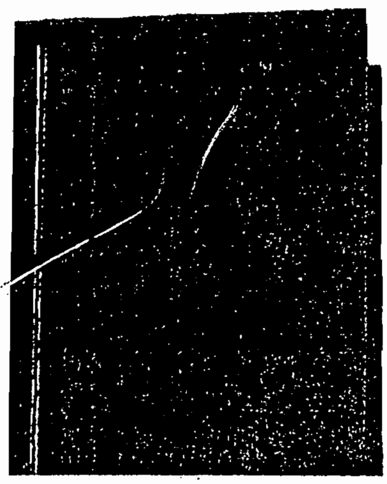


Venturies are used in most conventional collectors that use a pulse jet bag cleaning system. Venturies help to develop the pressure that's needed to burst the dust cake on filter bags. However, venturies also restrict filtering velocity, impede cleaning, and cause puffing. They're eliminated in the SPJ design!

Scientifically shaped Mach 2 nozzles in the SPJ eliminate any need for venturies. Higher air to cloth ratios are achieved in the SPJ without venturies, as a result of the following important features:

- **A higher volume of air is induced through larger bag openings.**
- **Each bag operates with a less dense dust cake without increased pressure drop.**
- **Cake bursting pressure is nearly uniform top to bottom.**
- **Entire length of each bag is cleaned.**
- **Abrasion from puffing around the top of bags is eliminated.**

QUALITY THAT GOES BEYOND OTHERS



The most often heard comments from users who compared a Scientific SPJ with other brands, are about the remarkably high degree of quality in the SPJ. Actually, such comments are expected, because Scientific Dust Collectors concentrate on building <u>only</u> the highest quality collectors.

The high degree of quality in an SPJ is particularly evident in the strength of construction, and in the performance of the most advanced compressed air cleaning system in the world. These features alone set the SPJ apart from all other fabric collectors. Because of these and many other standard features, the SPJ is now the world's most successful pulse jet fabric collector.

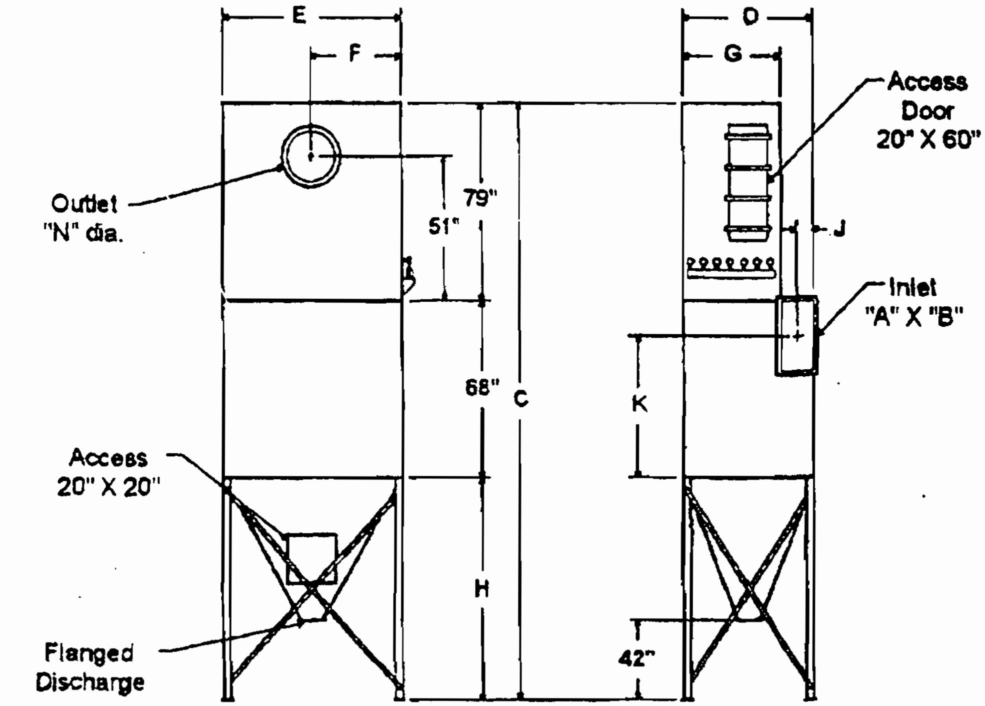
SCIENTIFIC DUST COLLECTORS

Outstandi

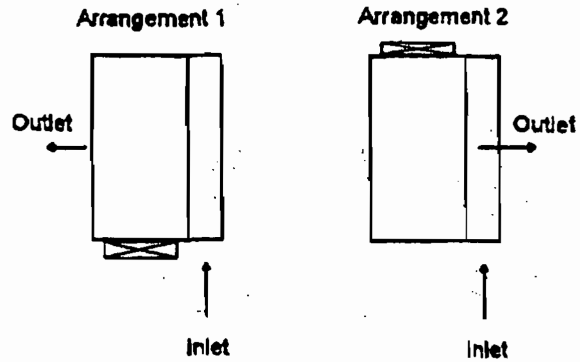
- **HIGH SIDE INLET/DROPOUT BOX**
  Dust laden air enters parallel to baffle. Baffle and bags protected against abrasion. A true downflow design.
- **TOP AND BOTTOM REMOVAL MODELS**
- **WALK-IN PLENUM ON MOST TOP REMOVAL MODELS**
- **HINGED ACCESS DOOR 20" x 60" ON WALK-IN PLENUMS**
- **SNAP BAND BAG ON TOP REMOVAL MODELS**
  Most reliable bag attachment available. No clamp or holddown necessary. Easy to change.
- **HOUSING CONSTRUCTION IS 12 GA MINIMUM**
- **HOUSING STIFFENED TO ± 20" WG MINIMUM**
- **TUBE SHEET 3/16" THICK MINIMUM**
  Avoids warping, cracks, leaks.
- **ALL WELDED CONSTRUCTION**
  Minimum field assembly.
- **LEGS AND CROSS BRACING FOR OUTDOOR INSTALLATION**
- **60° MINIMUM HOPPERS**
  For continuous dust removal.
- **DUST TRAP ON PRESSURE PICKUP**
  Protects pressure gauges.
- **SOLID STATE CONTROLS IN NEMA 4 ENCLOSURE**

SPJ-6

Mo.	Filter Area (ft^2)	Qty of Bags	Qty of Valves	Cleaning Air Required (SCFM)	Unit Weight (lbs)	Inlet Size "A" x "B"	C	D	E	F	G	H	J	K	Outlet "N" dia. I.D.	Model
SPJ-40-X4T6	280	40	5	1.6 to 13.1	3,100	14 x 26	20' - 0"	4' - 10"	5' - 6"	33"	44"	91"	9"	52"	22"	SPJ-40-X4T6
SPJ-48-X4T6	336	48	6	2.0 to 13.1	3,400	16 x 29	20' - 0"	5' - 6"	5' - 6"	33"	51"	91"	9-1/2"	51"	24"	SPJ-48-X4T6
SPJ-56-X4T6	392	56	7	2.3 to 13.1	3,700	16 x 32	20' - 8"	6' - 3"	5' - 6"	33"	59"	99"	10"	49"	26"	SPJ-56-X4T6
SPJ-64-X4T6	384	64	8	2.6 to 13.1	4,100	18 x 33	21' - 5"	7' - 0"	5' - 6"	33"	66"	107"	11"	49"	27"	SPJ-64-X4T6
SPJ-72-X4T6	504	72	6	2.9 to 19.6	4,650	18 x 36	22' - 2"	5' - 8"	8' - 0"	48"	61"	116"	11"	47"	29"	SPJ-72-X4T6
SPJ-84-X4T6	588	84	7	3.4 to 19.6	5,000	20 x 38	22' - 1"	6' - 7"	8' - 0"	48"	69"	116"	12"	46"	31"	SPJ-84-X4T6
SPJ-96-X4T6	672	96	8	3.9 to 19.6	5,300	21 x 42	22' - 2"	7' - 3"	8' - 0"	48"	66"	116"	12-1/2"	44"	34"	SPJ-96-X4T6
SPJ-108-X4T6	756	108	9	4.4 to 19.6	5,700	22 x 45	22' - 2"	8' - 0"	8' - 0"	48"	74"	116"	13"	43"	36"	SPJ-108-X4T6
SPJ-120-X4T6	840	120	10	4.9 to 19.6	6,100	24 x 45	22' - 9"	8' - 9"	8' - 0"	48"	81"	123"	14"	43"	38"	SPJ-120-X4T6
SPJ-132-X4T6	924	132	11	5.4 to 19.6	6,600	28 x 41	23' - 9"	9' - 10"	8' - 0"	48"	89"	134"	16-1/2"	45"	39"	SPJ-132-X4T6
SPJ-144-X4T6	1,008	144	12	5.9 to 19.6	7,200	34 x 38	24' - 8"	10' - 10"	8' - 0"	48"	96"	145"	19"	46"	41"	SPJ-144-X4T6



9-1/2" X 9-1/2" for SPJ-40 thru SPJ-84
11-1/4" X 11-1/4" for SPJ-72 thru SPJ-144



- ✓ Cleaning air to be clean and dry at 90 to 100 PSIG.
- ✓ All dimensions are inches unless otherwise indicated.
- ✓ Dimensions are nominal only. Request certified drawing for exact dimensions.

Scientific Dust Collectors

4101 West 126th Street, Alsip, IL

A Vectoradyne Ltd. Company

Model SPJ Pulse Jet Fabric Dust Collector

Top Removal w/ Walk-In Plenum -- 6' Bags

Wood Shop

ATTACHMENT 2

MSDS INFORMATION

PROPOSED GELCOAT

MATERIAL SAFETY DATA SHEET

FOR COATING, RESINS, AND RELATED MATERIALS

ıte of Preparation- 02-11-99
epared by- R. Smothers
nufacturer: LILLY INDUSTRIES, INC.
dress : 2355 Southwest 66th Terrace
Davie, Florida 33317

lephone#: (305) 475-0150 Night: (305) 475-0150
ergency#: (305) 475-0150 Night: (800) 424-9300

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SECTION I PRODUCT IDENTIFICATION

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nufacturer's Code Identification: 5776W90177
oduct Class: POLYESTER GELCOAT
ade Name: OYSTER WHITE (MONTEREY)

IS Information: Health- 2 Flammability- 3
Reactivity- 2 Personal Protective Equipment- X
ZARD INDEX: 4= Severe 3= Serious 2= Moderate 1= Slight 0= Least
*= Chronic health hazard
Ask your supervisor for specific handling directions (See Section VIII).

****

SECTION II HAZARDOUS INGREDIENTS

THYL METHACRYLATE
1 CAS# 80-62-6
BY WT: 6.000 VAPOR PRESSURE: 29.00 MMHG @ 20C

POSURE LIMIT
ACGIH TLV (TWA) 100.00 PPM
OSHA PEL (TWA) 100.00 PPM

YRENE MONOMER
2 CAS# 100-42-5
BY WT: 31.464 VAPOR PRESSURE: 9.50 MMHG @ 20C

POSURE LIMIT
ACGIH TLV (TWA) 50.00 PPM
OSHA PEL (TWA) 100.00 PPM
ACGIH STEL 100.00 PPM
Skin notation YES
Carcinogen 2B, IARC

Proposed

BEST AVAILABLE COPY

MATERIAL SAFETY DATA SHEET

S776W90177
OYSTER WHITE (MONTEREY)

****

****

This product contains pigments which may become a dust nuisance when
:moved by abrasive blasting, sanding, or grinding.

****

****

SECTION III PHYSICAL DATA

›iling Range: High- 261.0 F Low- 214.0 F
ıpor Pressure: See Section II
ıpor Density: Heavier Than Air
/aporation Rate: Equal to Butyl Acetate
›ight per Gallon: 10.78
Volatile by Weight: 37.35
›pearance: N/A
(: N/A

****

SECTION IV FIRE AND EXPLOSION HAZARD DATA

.ammability Classification: Class 1C
:tual Flashpoint TCC: 88.0 F
:plosion Level: Lower- 1.1 Upper- 12.5
›wer Flammability Limit: N/A
AT PROTECTION PROCEDURES
ntainers exposed to intense heat from fires should be cooled with water
prevent vapor pressure buildup which could result in container rupture.
TINGUISHING MEDIA

e CO2, Dry Chemical, or Foam extinguisher.
e National Fire Protection Association Class B extinguisher is designed
extinguish fires originating from burning liquids.
ECIAL FIRE FIGHTING PROCEDURES
ter spray may be ineffective. Water may be used to cool closed containers
prevent pressure buildup and possible autoignition or explosion when
posed to extreme heat. If water is used, fog nozzles are preferable.
USUAL FIRE AND EXPLOSION HAZARD:
ep containers tightly closed. Isolate from heat, electrical equipment,
arks and open flame. Closed container may explode when exposed to
treme heat. Do not apply to hot surfaces. Never use welding
cutting torch on or near container (even empty) because product
ven residue) may ignite explosively.

RESIN

MATERIAL SAFETY DATA SHEET

Ashland Chemical Co.

Page 001
Date Prepared: 01/26/98
Date Printed: 02/28/98
MSDS No: 304.0243198-004.009

AROPOL AME 4000 Q-6454S ACC GP

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity
Product Name: AROPOL AME 4000 Q-6454S ACC GP
Product Code: 3006079
General or Generic ID: UNSATURATED POLYESTER RESIN

Company
Ashland Chemical Co.
P.O. Box 2219
Columbus, OH 43216
614-790-3333

Emergency Telephone Number:
1-800-ASHLAND (1-800-274-5263)
24 hours everyday

Regulatory Information Number:
1-800-325-3751

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	% (by weight)
STYRENE	100-42-5	44.0
POLYESTER RESIN	Trade Secret	53.0- 58.0

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye
Can cause eye irritation. Symptoms include stinging, tearing, redness, and swelling of eyes.

Skin
Can cause skin irritation. Prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, and drying and cracking of skin, burns and other skin damage. Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

Swallowing
Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. This material can get into the lungs during swallowing or vomiting. This results in lung inflammation and other lung injury.

Inhalation
Breathing of vapor or mist is possible. Breathing aerosol and/or mist is possible when material is sprayed. Aerosol and mist may present a greater risk of injury because more material may be present in the air than from vapor alone. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms usually occur at air concentrations higher than the recommended exposure limits (See Section 8).

Continued on next page

RESIN

MATERIAL SAFETY DATA SHEET

Ashland Chemical Co.

Date Prepared: 01/26/98
Date Printed: 02/28/98
MSDS No: 304.0243198-004.009

AROPOL AME 4000 Q-6454S ACC GP

Symptoms of Exposure

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: metallic taste, stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness) and other central nervous system effects, loss of coordination, confusion, liver damage.

Target Organ Effects

Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals, and may aggravate pre-existing disorders of these organs in humans: mild, reversible kidney effects, effects on hearing, respiratory tract damage (nose, throat, and airways), testis damage liver damage, Overexpcsure to this material (or its components) has been suggested as a cause of the following effects in humans, and may aggravate pre-existing disorders of these organs: central nervous system effects, mild effects on color vision, effects on hearing, respiratory tract damage (nose, throat, and airways)

Developmental Information

This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain.

Cancer Information

In 1993, the International Agency for Research on Cancer (IARC) classified styrene in group 2B (possibly carcinogenic to humans). IARC concluded that there was no convincing evidence for carcinogenic action of styrene in animals based on the animal studies which existed at that time. Rather, the IARC 2B listing was based on data for styrene oxide, a metabolite of styrene. Two recent lifetime studies with styrene, one in rats and one in mice, have been completed since the 1993 review. There was no increase in cancer in styrene-exposed rats. However, there was an increase in lung cancer in styrene-exposed mice. The relevance of the mouse lung cancer to humans is uncertain. Styrene exposure has not been associated with an increased incidence of cancer in workers including those in the reinforced plastics and composites plastics industries.

Other Health Effects

Styrene readily reacts with low concentrations of halogens (for example, fluorine, chlorine, bromine, or iodine) to form a tear-producing substance.

Primary Route(s) of Entry

Inhalation, Skin absorption, Skin contact, Eye contact.

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4. FIRST AID MEASURES

Eyes

If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention.

Continued on next page

RESIN

MATERIAL SAFETY DATA SHEET

Ashland Chemical Co.

Date Prepared: 01/20/98
Date Printed: 01/24/98
MSDS No: 304.0271894-004.007

AROPOL Q 6390 RESIN

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Material Identity
Product Name: AROPOL Q 6390 RESIN
Product Code: 572053
General or Generic ID: UNSATURATED POLYESTER RESIN

Company
Ashland Chemical Co.
P.O. Box 2219
Columbus, OH 43216
614-790-3333

Emergency Telephone Number:
1-800-ASHLAND (1-800-274-5263)
24 hours everyday

Regulatory Information Number:
1-800-325-3751

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient(s)	CAS Number	% (by weight)
POLYESTER RESIN	Trade Secret	58.0- 63.0
STYRENE	100-42-5	39.0

3. HAZARDS IDENTIFICATION

Potential Health Effects

Eye

Can cause eye irritation. Symptoms include stinging, tearing, redness, and swelling of eyes.

Skin

Can cause skin irritation. Prolonged or repeated contact may dry the skin. Symptoms may include redness, burning, and drying and cracking of skin, burns and other skin damage. Passage of this material into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.

Swallowing

Swallowing small amounts of this material during normal handling is not likely to cause harmful effects. Swallowing large amounts may be harmful. This material can get into the lungs during swallowing or vomiting. This results in lung inflammation and other lung injury.

Inhalation

Breathing of vapor or mist is possible. Breathing aerosol and/or mist is possible when material is sprayed. Aerosol and mist may present a greater risk of injury because more material may be present in the air than from vapor alone. Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms usually occur at air concentrations higher than the recommended exposure limits (See Section 8).

Continued on next page

Resin

MATERIAL SAFETY DATA SHEET

Ashland Chemical Co.

AROPOL Q 6390 RESIN

Symptoms of Exposure

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Target Organ Effects

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Developmental Information

This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain.

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Other Health Effects

Styrene readily reacts with low concentrations of halogens (for example, fluorine, chlorine, bromine, or iodine) to form a tear-producing substance.

Primary Route(s) of Entry

Inhalation, Skin absorption, Skin contact, Eye contact.

4. FIRST AID MEASURES

Eyes

If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention.

Continued on next page

REST OF MSDS INFORMATION NOT SENT TO CINDY. Pradeep.

KOOGLER & ASSOCIATES