DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION
ACTIVITY REPORT: Scheduled Inspection

N687424436

FACILITY: Quantum Composites, Inc.		**SRN / ID:** N6874
LOCATION: 1310 South Valley Center Drive, BAY CITY		**DISTRICT:** Saginaw Bay
CITY: BAY CITY		**COUNTY:** BAY
CONTACT: Dennis Mehl , Director of Manufacturing		**ACTIVITY DATE:** 03/06/2014
STAFF: Kathy Brewer	**COMPLIANCE STATUS:** Compliance	**SOURCE CLASS:** MAJOR
SUBJECT:		
RESOLVED COMPLAINTS:		

I (KLB) conducted an announced inspection of the Quantum Composites, Inc., in Bay City, MI. Mr. Dennis Mehl, Director of Manufacturing, and Mr. Duane Gohr, Shift Supervisor, accompanied me during my site visit. The facility was issued ROP # MI-ROP-N6874-2011 to limit VOC and HAP emissions. The facility is subject to 40 CFR Part 63, Subpart WWWW, Reinforced Plastic Composites Production. No violations of air quality regulations were found during the inspection.

The facility is a sheet molding compound (SMC) and bulk molding compound (BMC) manufacturing facility. Resinous paste, filers, and product enhancers are mixed in batches in one of seven mixers that range in size from five gallons to 300 gallons. The emissions from the mixers are controlled by a VTI dust collector which then vents to the energy recovery unit. The paste mixture is transferred to one of the three molding compound machines. Fiberglass or carbon fiber may be added to the paste mixture for reinforcement and the paste mixture is spread between layers of carrier film. Heat and chilling may be used to control reaction rates. The product is packaged and shipped or placed in a cooler. Production equipment is cleaned with solvents. The used solvents are temporarily stored on site until disposed. There are also quality assurance and product development testing laboratories.

All in plant air is vented to the VTI dust collector which is then vented to the 2.8 MMBTU energy recovery unit.

FGSMCBMC (EUSMCI, EUSMCII, EUSMCIII, EUMIXERS, EUBMCMIXER, EUSOLVENT, EUPRESS): **Compliant**

All three sheet molding compound processes are similar.

We viewed the resin storage and weigh station associated with mixing activities including the maleic acid mixing booth with emission collector. Mr. Gohr showed me the floor run records for resin batch sheets and SMC Formulation, and Mix Logs that each operator completes. The facility is currently operating between one and two shifts. The floor run records are used for production records and environmental reporting by updating the facility's record keeping system "MRP", for material usage including maleic anhydride and polystyrene. I also viewed the January 2014 floor records for shipping.

The EUSMCI process starts with the application of a bottom layer of resin mixture. Carbon fiber or fiberglass fibers are added on top of the resin. A film is rolled on top of the resin/fiber material. The mixture begins to cure as it travels along a conveyor. EUSMCI has the ability to heat the sheet molding compound with emissions exhausted to SV-14. The curing sheet of material can then be chilled to curtail the speed of the curing. All emissions after the heated portion of the process are vented to the in plant air which is then vented to the energy recovery unit.

The facility verifies the organic content of the raw products on a regular basis. The mixed formulations are specific to each customer's needs and must be accurate to obtain desired characteristics. The production material use values for air pollution records assume 100% of the material purchased is used in production.

Product Shop Hours are recorded by each employee. We reviewed the January 2014 Shop Hour sheets. A blank copy of an Operator activity record and a partially completed Formulation & Mix Log are attached. Each employee records the amount of time spent on a run including cleanup time when solvents are used. The Formulation & Mix Log record is for a run on EUSMCII. I viewed the original log. The ingredient list is blanked out on the attachment.

The facility has emission limits of 37.2 tpy VOC and pound per hour limits for styrene, methanol, and PM10. The site has pounds per hour processing rate limits or 64,600,000, 180,000. and 1,000,000 for EUMIXERS, EUBMCMIXER, and EUPRESS respectively. The production information from the Formulation & Mix Log and the employee time record is used to generate a site compliance report with hours of operation and pounds of each formulation used by process equipment/emission unit.

I reviewed the hourly styrene emission rate records for January 2013. The emission rate ranges from 0.444 pounds/hour to 1,346 pounds /hour. The January 2 - 5, 2013 operation and emission records are attached. On January 2, 2013 the site used 9,720 pounds of mixture, emitted 10.38 pounds of styrene, and operated a total of 9 hours. On site electronic records showed compliance with the process rate limits and hours/year operating limits for each SMC. A summary of 2013 process rates and operating hours is attached.

Short term solvents usage is determined by a measuring stick correlated to the containers volume. The liquid height is recorded by floor workers, converted to volume used, and recorded. A copy of the solvent use record for January 2014 is attached. Annual solvent usage is based on amount of solvent used minus amount of solvent sent for disposal. We reviewed electronic records for solvent usage, disposal & emission calculations.

EUSMCI has a Torit dust collector used to control particulate matter from fiber chopping. The Torit dust collector is vented to the in plant air. The Torit dust collector is used to collect dust from carbon fiber cutting operations. EUSMCI was producing a fiberglass containing

composite without carbon fiber added so the Torit was not in operation. There is no pressure gauge on the Torit. I was told the Torit cartridges are cleaned periodically and replaced as needed. This is usually just a few times each year based on a visual inspection.

The VTI has an automated pulse jet cleaning cycle. I observed a pulse sound from the VTI during the inspection. The differential pressure gauge has an indicated proper operating range of 0.1 to 1 inches Hg. At the time of the inspection the pressure gauge read 0.01 inches Hg. Mr. Mehl stated that the bags had been changed 2 weeks prior.

We viewed some permit exempt emission units in the product development laboratory. We also viewed the bulk storage area and refrigerated product storage,

We viewed electronic emission records including calculations for 12 month rolling averages for HAPs and VOCs. The facility maintains a separate database to provide year to date information.

The 2013 emission totals are available by emission unit, pollutant, pounds/day, and hours. The production records contain the specific compounding information. The facility's ROP contains site specific calculations in Appendix 7 for emissions from FGSMCBMC.

Records of 12 month rolling totals for VOCs and HAPs are attached. During 2013, the facility had 5,406 pounds of VOC emissions from mixing and molding compound processes and 3,019 pounds of VOCs and HAPs were emitted from solvent usage. A summary of the emissions is attached.

FGMACT (EUSMCI, EUSMCII, EUSMCIII, EUMIXERS, EUBMCMIXER, EUSOLVENT, EUPRESS): Compliant

The facility has potential emissions for styrene of over 22 ton per year and for methanol over 10 ton per year. The flexible group has a 12 month rolling limit of less than 100 tons per year of HAPs. We viewed the electronic records for FGSMCBMC. Total emissions in pounds for January – December 2013 are listed below.

Pollutant	12 month emissions VOC in pounds	12 month emission HAPs in pounds
Formaldehyde	0	0
Maleic Anhydride	10	10
Methanol	3918	3918
Phenol	7	7
Styrene	1471	1471
Acetone (solvent usage)	0	(n/a)
Ethyl Acetate (solvent usage)	3019	(n/a)
Total	8425	5406

A summary of VOC and HAP emissions by emission unit and flexible group is attached.

The facility provided Notification of MACT WWWW Applicability on May 17, 2011. The facility is subject to the work practice standards in Table 4 of 40 CFR, Part 63, Subpart WWWW (attached). The site maintains records of the chemical composition of each material used. The facility uses acetone and ethyl acetate for cleanup – both non-HAP solvents. The mixers and SMC manufacturing machines had covers and delivery systems that appeared to be compliant with the required work practices at the time of the inspection.

NAME [signature] DATE 3/24/2014 SUPERVISOR [signature]

Daily / Weekly Time Record

Pay Period from: _____ **to** _____

Employee Name: _____ Employee Number: _____

What Job or Duties	MON	TUE	WED	THUR	FRI	SAT	SUN	Total
General Plant Maintenance								
Shipping								
Receiving / Stocking								
Training / Meetings								
Vacation / Personal								
Holiday								
Inventory Control / Organization								
Mechanical Maintenance								
Carbon Fiber De-Coring								
_____ Maintenance								
Other								
Collecting Lab Samples								

Date	Shop Order No.	Material Name	Dev'l Time	Operation 10, SU	Operation 20, Run	Operation 30, CU				
Direct Total (All production)										
Indirect Total (Top half of time-sheet)										
Development Total (All development)										
			MON	TUE	WED	THUR	FRI	SAT	SUN	
Grand-Total										

Employee Signature _____ **Supervision Approval** _____

Quantum

3-6-14 KB

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8849 RD XP126-23-67 25.6

Quantum Composites inc., Formulation and Mix Log

3/6/2014

Mixer used = Cowles Shar Lytex Small

Mix Start / Mix End		
Batch Size / Tank Size	2650	1114
Temperature / Humidity	°F	%RH
Machine / Shift	SMC II	1
SMC Start / SMC End		

LOT NO.

QC

COLOR:

LAB BOOK NO.

FOR:

SO

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0	INGREDIENTS	QCM #	% BOT	WEIGHT	INIT.	LOT NUMBER	COMMENTS
1		823	21.010%	**556.77**		**0918131**	
2		511	0.019%	**0.50**			
3		738	8.000%	**212.00**			
4		523	1.700%	**45.05**			
5		802	0.331%	**8.77**			
6		747	0.579%	**15.34**			
7		744	0.104%	**2.76**			
8		784	3.000%	**79.50**			
9		748	3.000%	**79.50**			
10		887	0.014%	**0.371**			
11		500	0.445%	**11.79**			Pre-Blend
12		403	3.750%	**99.38**			Thickener
13		811	0.100%	**2.65**			Masterbatch
14		803	7.230%	**191.60**			**195.43**
15		705	0.250%	**6.63**			**6.76**
16		517	49.00%	**1299**			**202.18**
17					Raw Materials Scrapped		
18					Film	Fiber	Other
19	30" PLIANT FILM	762	2.64%	70			
20	Boxes	842	1/90#	29	Finished Product Scrapped		
21	Cores	843	1/90#	29	CC	DE	DF ER
22	End caps	844	2/90#	59	FT	FC	HF HM
23	***9033 Thickener conversion factor***		**0.0059%**	**0.1779%**	FS	LF	LM MP
24	***7263 Thickener conversion factor***		**0.1719%**		MS	OE	PC SR
25							
85	TOTALS		98.53%	2611.1			lbs.,oz.,(grams)

	SETUP PARAMETERS		DENSITY	~1.2	gm/cc		
##	PASTE VISCOSITY	~1500	cps.30°C		cps.	°C-LV	@ RPM
	MAT WEIGHT	8.0	oz. / ft.^{2}	± 0.5	227	Target amount	2584
	DR. BOX SETTINGS	30 / 30	thousandths of an inch			Total amount	
	PAN WEIGHT	114	gms./ ft.^{2}			Scrap	
	FEET / MINUTE	27				No. of Rolls	
99	Pounds per hour	1620	Run time	1.64	hrs.	Total est. time	3.14

Special Instructions:

Combination Cut @ 2"-1"-1"-2"-1"-1"-2"-1"-1"-etc.

Hold Glass Content to 48% - 50%

Take 1 paste retain can every 1000 lbs.

3-6-14
KCB

Quatum 3-6-14

Month/Year JAN 2014

MONTHLY SOLVENT USAGE IN GALLONS

	New Ethyl Acetate (SP182)			Spent Ethyl Acetate (SP182)		
Day of the Month	Beginning Amount (Carry over from previous month)	Gallons and Date when Drum is Opened	Ending Amount (Carry over to next month) (Difference in parentheses)	Beginning Amount (From last month) (Difference in parentheses)	Gallons and Date when Drum is Filled	Ending Amount (Carry over to next month)
1	17			55&52		
2						
3						
4					55	
5						
6	[illegible]	55				
7						
8						
9		55			55	
10						
11		55			55	
12						
13						
14						
15					55	
16		55				
17						
18						
19						
20		55				
21					54	
22						
23		55			55	
24						
25						
26						
27		55				
28					55	
29		55				
30					55	
31			50			22.5&12.5
	Gallons Clean Solvent	407	**Gallons Spent Solvent**	372	**Total Gallons Used**	35

Quantum Air Permit Recordkeeping

Start Date: 1-1-2013 End Date: 12-31-2013

QUANTUM COMPOSITES
PROPRIETARY

Date	Emission Unit	Product Group	Formulation / Solvent ID	% Styrene	Production lbs/day	Hours	Pollutant	Emission Rate / Emission Factor	Emissions lbs/day	Pollutant	Emission Rate / Emission Factor	Emissions lbs/day
1/2/2013												
	EUSMCI	Polyester	8593HT NT	11.14%	120	0.2	Styrene	1.346 lb/hr	0.29			
	EUSMCI	Polyester	8593NT	11.14%	2,150	4.4	Styrene	1.346 lb/hr	5.87			
	EUSMCII	Polyester	8822BK	7.37%	3,150	1.8	Styrene	1.346 lb/hr	2.43			
	EUSMCII	Polyester	8822WT	7.37%	2,150	1.3	Styrene	1.346 lb/hr	1.79			
	EUSMCII	Polyester	8822YL	7.37%	2,150	1.3	Styrene	1.346 lb/hr	1.79			
	EUMIXERS	Epoxy	572	0.00%	1	0.0	Styrene	0.1419 lb/hr	0.00	Maleic Anhydride	0.0032 lb/hr	0.000
1/3/2013												
	EUSMCI	Epoxy	9063BK-E-26	6.11%	9,170	13.0	Styrene	0.584 lb/hr	7.62	Maleic Anhydride	0.0062 lb/hr	0.081
	EUSMCII	Polyester	8595NT	9.94%	425	1.3	Styrene	1.346 lb/hr	1.72			
	EUMIXERS	Epoxy	570	17.43%	1,210	1.0	Styrene	0.1419 lb/hr	0.14	Maleic Anhydride	0.0032 lb/hr	0.003
	EUMIXERS	Epoxy	570	17.43%	1,210	1.0	Styrene	0.1419 lb/hr	0.14	Maleic Anhydride	0.0032 lb/hr	0.003
	EUMIXERS	Epoxy	570	17.43%	1,210	1.0	Styrene	0.1419 lb/hr	0.14	Maleic Anhydride	0.0032 lb/hr	0.003
	EUMIXERS	Epoxy	577	0.00%	54	0.0	Styrene	0.1419 lb/hr	0.01	Maleic Anhydride	0.0032 lb/hr	0.000
1/4/2013												
	EUSMCI	Epoxy	9063BK-E-26	6.11%	10,356	14.7	Styrene	0.584 lb/hr	8.60	Maleic Anhydride	0.0062 lb/hr	0.091
	EUMIXERS	Epoxy	570	17.43%	1,210	1.0	Styrene	0.1419 lb/hr	0.14	Maleic Anhydride	0.0032 lb/hr	0.003
	EUMIXERS	Epoxy	570	17.43%	1,210	1.0	Styrene	0.1419 lb/hr	0.14	Maleic Anhydride	0.0032 lb/hr	0.003
	EUMIXERS	Epoxy	570	17.43%	1,210	1.0	Styrene	0.1419 lb/hr	0.14	Maleic Anhydride	0.0032 lb/hr	0.003
	EUMIXERS	Epoxy	577	0.00%	61	0.1	Styrene	0.1419 lb/hr	0.01	Maleic Anhydride	0.0032 lb/hr	0.000
1/5/2013												
	EUSMCI	Epoxy	9063BK-E-18	6.06%	3,453	6.1	Styrene	0.584 lb/hr	3.59	Maleic Anhydride	0.0062 lb/hr	0.038
	EUMIXERS	Epoxy	570	17.43%	1,210	1.0	Styrene	0.1419 lb/hr	0.14	Maleic Anhydride	0.0032 lb/hr	0.003
	EUMIXERS	Epoxy	577	0.00%	20	0.0	Styrene	0.1419 lb/hr	0.00	Maleic Anhydride	0.0032 lb/hr	0.000

Overtons

TOTALS 2613

Emission Unit	Production lbs/day	Hours	Emiss
EUSMCI	120	0.2	0.29
EUSMCI	2,150	4.4	5.87
EUSMCII	3,150	1.8	2.43
EUSMCII	2,150	1.3	1.79
EUSMCII	2,150	1.3	1.79
EUMIXERS		1.0.0	0
EUSMCI	9,170	13.0	7.701
EUSMCII	425	1.3	1.72
EUMIXERS	1,210	1.0	0.143
EUMIXERS	1,210	1.0	0.143
EUMIXERS	1,210	1.0	0.143
EUMIXERS	54	0.0	0.01
EUSMCI	10,356	14.7	8.691
EUMIXERS	1,210	1.0	0.143
EUMIXERS	1,210	1.0	0.143
EUMIXERS	1,210	1.0	0.143
EUMIXERS	61	0.1	0.01
EUSMCI	3,453	6.1	3.628
EUMIXERS	1,210	1.0	0.143
EUMIXERS	20	0.0	0
Emission Unit	Production lbs/day	Hours	0
EUSMCI	10,356	14.7	8.691
EUMIXERS	1,210	1.0	0.143
EUMIXERS	1,210	1.0	0.143
EUMIXERS	1,210	1.0	0.143
EUMIXERS	61	0.1	0.01
EUSMCI	10,356	14.7	8.691
EUMIXERS	1,210	1.0	0.143
EUMIXERS	1,210	1.0	0.143
EUMIXERS	1,210	1.0	0.143
EUMIXERS	61	0.1	0.01
EUSMCI	10,250	14.6	8.6
EUMIXERS	1,210	1.0	0.143
EUMIXERS	1,210	1.0	0.143
EUMIXERS	1,210	1.0	0.143
EUMIXERS	61	0.1	0.01
EUSMCI	471	1.3	0.082
EUSMCI	120	0.2	0.29
EUSMCI	1,925	4.3	254.64
EUSMCII	2,897	1.2	1.67
EUSMCI	3,453	6.1	3.628
EUMIXERS	1,210	1.0	0.143
EUMIXERS	20	0.0	0
EUSMCII	11,150	4.4	5.93
EUSMCII	4,500	1.8	2.39
Emission Unit	Production lbs/day	Hours	0
EUSMCI	4,100	3.9	5.31
EUSMCII	2,000	1.2	1.56
EUSMCI	7,400	7.1	9.59
EUSMCI	879	2.4	1.445
EUSMCI	703	2.0	1.152
EUMIXERS	1,210	1.0	0.143
EUMIXERS	1,210	1.0	0.143
EUMIXERS		6 0.0	0
EUMIXERS		7 0.0	0
EUSMCI	1,850	5.0	0.336
EUSMCI	3,453	6.1	3.628
EUSMCI	3,453	6.1	3.628

Spreadsheet Summary

Values				
Row Labels	Sum of Production lb/day	Sum of Emiss	Sum of Hours	
Emission	0	0		Limit
Emission Unit	0	0	0	
EUMIXERS	326,840	42	294	
EUSMCI	1,102,366	4,994	1,821	6000
EUSMCII	566,409	393	292	6000
EUSMCIII	840	4	1	1000
Unit	0	0		
Grand Total	1,996,455	5,434	2,408	

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QUANTUM COMPOSITES - POLLUTANT EMISSIONS BY EMISSIONS UNIT

art Date: 1/1/2013 End Date: 12/31/2013

QUANTUM COMPOSITES
PROPRIETARY

EU:	Pollutant Name		Emissions (Lbs)
EUMIXERS			
	Styrene		42.07
	Maleic Anhydride		0.95
		Total VOC's For EU:	43.0
EUSMCI			
	Styrene		1,032.19
	Phenol		7.25
	Methanol		3,917.97
	Maleic Anhydride		9.20
	Formaldehyde		0.13
		Total VOC's For EU:	4,966.7
EUSMCII			
	Styrene		392.84
		Total VOC's For EU:	392.8
EUSMCIII			
	Styrene		4.40
		Total VOC's For EU:	4.4
		Total lbs VOC Emissions For Time Period:	5,407.0
		Total Tons VOC Emissions For Time Period:	2.70

Note: Solvent emissions are accounted for separately

3-26/14

QUANTUM COMPOSITES - NET SOLVENT USAGE REPORT

art Date: 1/1/2013 End Date: 12/31/2013

QUANTUM COMPOSITES
PROPRIETARY

Solvent Name	Total Solvent Used (Gal)	VOC Content (lbs/gal)	VOC Emissions (lbs)	HAP Emissions (lbs):
Acetone	175	0.00	0	0
SP-182	446	6.77	3,019	3,019
Totals For Time Period:	621.0		3,019	3,019

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QUANTUM COMPOSITES - FACILITY POLLUTANT EMISSIONS*

art Date: 1/1/2013 End Date: 12/31/2013

QUANTUM COMPOSITES
PROPRIETARY

EU:	Pollutant Name	Emissions (Lbs)
FGSMCBMC		
	Formaldehyde	0
	Maleic Anhydride	10
	Methanol	3,918
	Phenol	7
	Styrene	1,471
	Total lbs Facility VOC Emissions For Time Period:	5,407
	Total Tons Facility VOC Emissions For Time Period:	2.70

*VOC's from solvent cleaning are not reflected here - total the above emissions plus VOC from solvent To determine total facility VOC emissions.

3-6-14

Total Solvent Used Solvent Name	(Gal)	VOC Content (lbs/gal)	VOC Emissions (lbs)	HAP Emissions (lbs):
Acetone	232	0.00	0	0
SP-182	433	7.5	3248	
Totals For Time Period:	665		3248	0

QUANTUM COMPOSITES - NET SOLVENT USAGE REPORT Start Date: 1/1/12 End Date: 12/31/12

Total Solvent Used Solvent Name	(Gal)	VOC Content (lbs/gal)	VOC Emissions (lbs)	HAP Emissions (lbs):
Acetone	232	0.00	0	0
SP-182	433	7.5	3248	
Totals For Time Period:	665		3248	0

QUANTUM COMPOSITES - NET SOLVENT USAGE REPORT Start Date: 1/1/12 End Date: 12/31/12