Container Product Line

W. R. Grace Limited

Cromwell Road
St. Neots
Huntingdon
Cambs. PE19 2ER

Telephone: (0480) 475061
Facsimile: (0480) 407226

GRACE

Mr.J. Allen,
Huntingdonshire District Council
Pathfinder House,
St. Mary's Street,
Huntingdon.
Pe18 6TM

Dear Mr Allen

EPA Authorisation- Upgrade Plan

Please find enclosed the following documents:

1 Updated description of the process. This now includes the following new items

a) BULK POWDER STORAGE SILO

b) HEPTANE STORAGE TANK

C) COMPOUND STORAGE TANKS

2 Annual MASS BALANCE figures for the years 1989-90, 1991-92, 1992-93 and 1993-94.

3 Our planned actions to meet the conditions of the Authorisation.

With reference to point 3 we would like the opportunity to discuss our response before it goes into the public register. Please give me a call on 475061 to arrange a convenient time to meet.

yours sincerely

G.D.Irwine
Site EHS Manager

Registerd Office, Northdale House, North Circular Road, London, NW10 7UH. Registered Number 248241.

No. Q6007

MARCH 1995

Description of Process

The process is prescribed for Local Authority Air Pollution Control under Section 6.6 of Schedule 1 to the Environmental Protection (Prescribed Processes and Substances) Regulations 1991, SI 472 (as amended). It consists of the production of a dispersion of rubber in solvent which is used extensively throughout the food industry as a sealant for containers. The layout of the plant is as shown on the attached drawing 19/93/B.

The first part of the process takes place in the rubber compounding room within the container plant. Four basic rubbers, styrene butadiene, neoprene, butyl, and nitrile are used in various formulations according to the required mix. The constituents are mixed mechanically in a single water cooled Banbury mixer in which the rubber mixture reaches a temperature of 100°C. A coarse rubber mass is produced which is then transferred to a 2 roll mill situated immediately beneath the Banbury mixer where further mixing and compounding takes place. Carbon black is used in the process but is either pre-mixed with the rubber ingredients before delivery to site or is introduced to the Banbury mixer in plastic bags which are designed to disintegrate under heat to minimise the release of carbon black dust.

The rubber compound is removed from the 2 roll mill in the form of strips which are fed to a chipper to be cut into small strips. From the chipper, the strips are fed along a covered conveyor system which transfers them to the next part of the process in the solvent plant.

The prescribed substances which can be emitted to air from the first part of the process include rubber dust and fume produced during the handling, weighing, mixing and milling of raw materials. Mechanical extract ventilation is provided within the rubber compounding room at points 1, 2, 3, 20 and 21 as shown on the attached drawing number 19/93/B and consists of the following:

Point 1 is vented at 28 feet above ground level. It is connected to a DCE Dalamatic automatic filter system with automatic pressure blowdown. The captured dust is released into a sealed container during the reverse pressure blowdown operation which occurs every 12 seconds.

Points 2, 20 and 21 are vented at 44 feet above the level of the ground and 4 feet above the level of the roof.
- Point 2 is connected to a DCE Unimaster dust collection unit, series UMA 250. It consists of 29 cotton filter bags which release the captured dust into a sealed container when the unit is switched off at the end of each shift.

- Points 20 and 21 are each connected to a DCE Unimaster dust collection system. They are sited on top of two powder hoppers and release the captured powder back into the hoppers when they are switched off at the end of each shift.

Point 3 is vented at roof level, 40 feet above ground level. It is connected to an extraction fan and motor.

The ingredients used in the rubber compounding room are supplied by road vehicles either as bulk powder stored in the silo marked S or on 1 tonne pallets which are stored within the container plant building prior to use.

When the rubber strips are transferred to the solvent plant they are fed to one of the 4 mixers also shown on drawing 19/93/B and identified as SW, MM, SSW and EKATO. Within these mixers the rubber compound is dispersed in one of three solvent systems known as Darex 9291 ES, Darex 100A/39LVE and Darex SLC 239. The bulk of the production involves the use of petroleum spirit consisting of C_5 - C_7 isomers with less than 5% n-hexane. Other solvents used include acetone, n and iso propyl alcohol, ethanol and other petroleum distillates for the manufacture of liquid fluxes, nozzle dousing fluids, lubricants and wetting agents for use in the can making industry.

The mixing process is carried out within closed mixers which are cooled by water jackets and are vented to atmosphere via pipe bundle type condensers with flame arresters. The mixers are constantly agitated by means of a mechanical stirrer and the resultant compound is pumped to storage in one of the seven bulk storage tanks identified as BT/1-7 on the attached drawing 19/93/B.

The bulk storage tanks are also vented to atmosphere via pipe bundle condensers with flame arresters. Mechanical exhaust ventilation is provided at the charge opening to each mixing vessel to minimise fugitive solvent emissions and the attached drawing 19/93/C shows a typical mixer unit with condenser, flame arrester and local exhaust ventilation system. Additionally there is a total building extraction system which vents at points 16 and 17.

All the exhaust vents from the solvent building are shown on drawing 19/19/B. Vents from the underground storage tanks (13,14,15) from the bulk tanks (4,5,6,7,8) mixers (10,11) vent at roof level, a height of approximately 40 feet. Mixer neck exhausts (12,18,19) as well as the total building extraction vent (16,17) through the building walls at a height of 30 feet.

Semifinished product in the bulk tanks is cooled by passing through water cooled heat exchangers and then homogenised to adjust the viscosity characteristics. Additional solvent is then added to adjust the compound to the required viscosity and total solids prior to packing into drums, tote tanks or road tanker.

A schematic representation of the whole process is shown on drawing 19/93/D.

The main solvents used in the process are stored in bulk tanks (2 x 45,000 litres 1 x 25,000 litres) located underground and one above ground tank (1 x 30,000 litres) as shown on drawing 19/93/B.

The tanks are vented to atmosphere via vent pipes which each have a flame arrester fitted at the termination. A 2000 litre isopropyl alcohol storage tank and a 4000 litre isoparaffin storage tank are situated inside the solvent building as shown on drawing 19/93/B. All solvents to these storage tanks are delivered to site by bulk tankers. The tanks and mixers within the solvent building are positioned inside bund walls and all the surface water drains on the site are connected to a 25,000 litres 3 compartment interceptor tank positioned at the eastern end of the site.

The total production throughput of solvent is approximately 4,500 tonnes per annum and the emission of volatile organic compounds to air amounts to approximately 60 tonnes per annum.

S

RUBBER COMPOUNDING ROOM

BANBURY

20 21

2

DCE

1

3.

CONTAINER PLANT

OIL TANK

CAR PARK

RUBBER COMPOUNDING ROOM
EXTRACTION SYSTEM

1. MAIN MILL ROOM EXTRACTION SYSTEM BOX VENT
2. CHIPPER EXTRACTION SYSTEM BOX VENT (ROOF LEVEL)
3. RUBBER CHIP CONVEYOR EXTRACTION (ABOVE WAREHOUSE ROOF)

20 + 21 POWDER HOPPER DUST BOX VENTS (ROOF LEVEL)

S. BULK POWDER SILO

23. HEPTANE STORAGE

SWITCH ROOM (SOLVENT PLANT)

11 10 18

SW MM SSW 9

13 14 15

UNDERGROUND HEXANE STORAGE 6

7

17 8

BT1 BT2 BT5

BT4 BT6 BT3 BT7

4 24 5 25 16

12 EXAC

19 LF

SOLVENT PLANT

IPA STORAGE TANK

22

SOLVENT BUILDING VENTILATION

4-8, 24, 25 - BULK TANK VENTS
9-12 - MIXER & VESSEL VENTS
13, 14 - UNDERGROUND HEXANE TANK VENTS
15 - " ACETONE " "
16, 17 - BUILDING EXTRACTION SYSTEM
18 - MIXER NECK RING EXTRACTION
22 - DUCTED AIR HEATER INLET
19 - LIQUID FLUX EXTRACTION
23 - HEPTANE TANK VENT

W.R GRACE LTD.
CONTAINER PRODUCTS
SITE PLAN
DRN.NO. 19/93/8

W.R. GRACE CONTAINER PRODUCTS

ANNUAL MASS BALANCE LOSSES

PERIOD	TOTAL PROCESS LOSS		"VOC LOSS"	
	Kg	%	Kg	%
Nov 89/Oct 90	106,958	2.4	88,973	2.0
Nov 91/Oct 92	92,064	1.9	73,365	1.5
Nov 92/Oct 93	81,801	1.6	61,334	1.2
Nov 93/Oct 94	79,625	1.2	54,703	0.8

W.R GRACE LTD. CONTAINER PRODUCT LINE , ST. NEOTS

Upgrade plan for compliance to operate a prescribed coating manufacturing process under Local Authority Air pollution Control , Section 6,6 of Schedule 1 Environmental Protection Act.

Condition no. Proposed action for compliance

1, In compliance

2, In compliance

3, In compliance

4, In compliance

5, Not applicable.

6, Rubber Compounding Room

A DUST CONTROL EQUIPMENT (DCE) dust filtration system operates at emission point 1 (drawing 19/93/b refers). Continuous quantitative monitoring equipment will be installed on the exhaust duct leading to atmosphere. Calibration of the monitoring equipment will be carried out at the time of installation and on the anniversary of installation each year. If after installation and calibration it is found that the concentration limits are exceeding the authorised limit an action plan will be raised to meet compliance before 1st April 1996.

DCE filtration equipment exists at emission points 2, 20 and 21. (drawing 19/93/b refers). At least once each calendar year, monitoring will take place to establish the 30 minute mean emission concentration from these emission points.

Solvent Building

Volatile Organic Compounds are in essence easy to detect, but to quantifiably measure VOC 's from vents has posed a problem for VOC emitters for many years. The following plan will help determine the best possible action to take to reduce our emissions to the authorised limit before 1st April 1999.

A) Measurement of vent emissions for a typical batch of compound ; flow rate by calculation, based on the pumping rate of the displacing liquid and the vapour temperature above and below the condenser and concentration of VOC's by measurement (F.I.D).

B) Specify and cost chiller system for solvent process condensers and heat exchangers.

Condition
No. 6cont/

C) Design and cost total vapour balance system to cover solvent tanks , delivery tanker, mixers, bulk tanks and packing process.

D) Cost catalytic oxidation system .

Points A), B), C) and D) above will be completed by July 1995. The project team will meet after the results and costings have been submitted and a decision will be formulated as to the best available technique to reduce the VOC emissions to the limit set out in the authorisation .The results of point A) above will be communicated to the Local Authority.

7, The actions proposed from the project to reduce VOC emissions from the solvent building are guided towards reducing the emission to below 1Kg per source per 8 hour working pattern.

8, Not applicable.

9, 10, 11 A record of visual and olfactory assessments of emissions to air from the solvent building and rubber compounding room is kept daily in a "log book". Weather conditions, wind speed, wind direction and temperature are recorded and the log book signed.

12, Exhaust volume flow rate measurements have been made on exhaust ventilation systems in the rubber compounding plant. These are set set out below.

Emission point (Drawing 19/93/b refers)	Volume flow rate (m3/min)
1	170,0
2	30,1
3	2,4
20	16,9
21	19,5

Under the controls listed in 12a and 12b the exhaust ventilation system attached to emission point 1 will have continuous quantitative measurements made of the total particulate matter. This action exceeds the requirement of the condition.

13, An inventory of solvents used in the manufacture of the product , in any cleaning process and that which is sent for waste disposal/ recovery shall be kept and forwarded to the Local Authority at least quarterly.

Condition no.

14, For the primary solvents used on site an annual inventory of mass balance losses will be calculated and documented. *Subject* to a successful test method being proven (see condition 6 Solvent Building) representative testing will be done to establish the 8 hourly mass emission values for those solvents that are emitted through the vents.

15, Not applicable. Technically it is not possible to continuously monitor VOCs at the time of writing the upgrade plan.

16,17,18 Not applicable

19 A report will be issued to the Local Authority summarising the continuous emission monitoring results from the rubber compounding room. The summary will be sent at least yearly.

20, A report will be issued to the Local Authority documenting the results from the mass balance calculation .

21 A report will be issued to the Local Authority documenting the results from of any monitorings, continuous or otherwise.

22 Will be complied with.

23, The underground storage tank vents have been modified to accommodate back venting during the unloading of bulk deliveries of solvent. Further engineering work will take place to include the vents into a vapour balancing system.

24, Level Indicators with automatic shutoff valves will be fitted to the bulk solvent storage tanks.

25, Procedures are in existence to deal with spillages of solvent.

26, It is envisaged that arrestment plant will not be needed. However should the concentration limits set out in the authorisation be exceeded, following the improvements noted in 6. above, arrestment plant will be provided at appropriate sites.

GENERAL

27, A monthly preventative maintenance schedule is in operation . This covers all essential maintenance to plant in the production process and to arrestment equipment which control emissions to air.

Condition
No.

28, The Standard Operation Procedure for each process involving the use of arrestment equipment covers the procedure to adopt if the arrestment equipment fails. This includes shut down of the process if necessary.

29, A procedure will be written into the site Environmental Health and Safety Manual to record in the log book and to inform the Local Authority of any abnormal emission which resulted from malfunction or breakdown of equipment and could have an effect on the local community.

30, Training of staff is provided through the use of Standard Operating Procedure . This includes the proper use of plant and machinery and the control equipment used to control emissions to air. Key personnel are identified in the log book.

31, A house keeping self audit programme is in operation. Findings and actions are 'published inhouse.

32, Records shall be kept for at least 4 years.

33, This plan to upgrade to the Local authorities authorisation was published on the 24th of April 1995.