27th February 2018

Rebecca Green FIMF AIEMA
Compliance Officer PPC
Natural Resources Wales
Rivers House
St Mellons Business Park
Cardiff
CF3 0EY

Dear Ms Green

Pollution Prevention & Control - PPC Permit BV7460ID

As per section 4.1.4 of the PPC regulations and reporting requirements, please find enclosed a review of Newport Wafer Fab fugitive emissions during 2017.

Yours sincerely

Alison Lewis
Facilities Tech Admin

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Fugitive Emissions Review Report

Introduction

The requirement for the fugitive emissions report comes from IP 4.1.4 of NWF PPC Permit BV7460ID and Section 2.2.4.1. This report is written using the guidance note for the Inorganic Chemicals sector IPPC S4 03.

Background

Newport Wafer Fab (NWF) is a semiconductor company and processes silicon wafers in a clean-room environment. Fugitive emissions on site are very limited and considered to be insignificant due to the small quantity of solvent used per wafer in the fabrication operations.

Dusts

NWF site will not emit dusts in normal operation. The fabrication plant rationalisation project does not emit dust due to the extant cleanroom conditions.

VOCs

NWF has solvent emission points to air in the PPC permit. These have all been monitored to emission limit values as per our emission point monitoring submissions.

Solvent waste collection points

Fabrication plant 11 (Fab11) houses two dedicated pressure rated solvent waste storage fixed tank systems with conservation vents such that minimal emissions are released during filling. Transfer to the off haul tanker is undertaken via a back venting system with lockable tanker connection, ensuring zero emissions to atmosphere.

Fabrication plant 10 North (Fab10N) has two fixed tanks in a below ground bunded area. Waste solvent is subsequently pumped to two above ground IBCs via double diaphragm pumps. A 1½ inch diameter filling pipe passes through the cap of the

IBC; the gap between the pipe and the cap is made as small as possible to minimise emissions.

The IBCs caps are only open while their content is transferred to the off haul tanker; this takes approximately ten minutes every six weeks.

Fabrication plant 10 South (Fab10S) has one fixed solvent tank located below ground within a bunded area. The waste solvent is transferred via ½" double diaphragm pumps to two above ground stainless steel tanks which equalise to atmosphere via a small activated carbon scrubber.

The stainless steel tanks are emptied by transfer to an off haul tanker via a back venting system with lockable tanker connection, ensuring minimal emissions to atmosphere.

For additional solvent waste storage capacity if the vented stainless steel tanks were to become full, there are two $1m^3$ IBCs. A 1½ inch diameter filling pipe passes through the cap of the IBC; the gap between the pipe and the cap is made as small as possible to minimise emissions.

The IBCs caps are only open while their content is transferred to the tanker; this takes approximately five minutes per IBC and happens approximately every two weeks.

All solvent tanks, bunds and pipework are visually inspected on a weekly basis, with a more detailed inspection undertaken monthly as part of our planned maintenance programme.

Process Solvent Containers

Process solvent containers are "just in time" delivered in 19, 100, 200 and 1000 litre containers and are held in bunded storage. The containers are sealed units which, to maintain the ultra-high purity of the solvent, are backfilled with nitrogen as the contents is depleted.

Empty drums are resealed ensuring no fugitive emissions from this source, and are held in a bunded storage yard prior to collection and recycling by the supplier or by the contract waste provider.

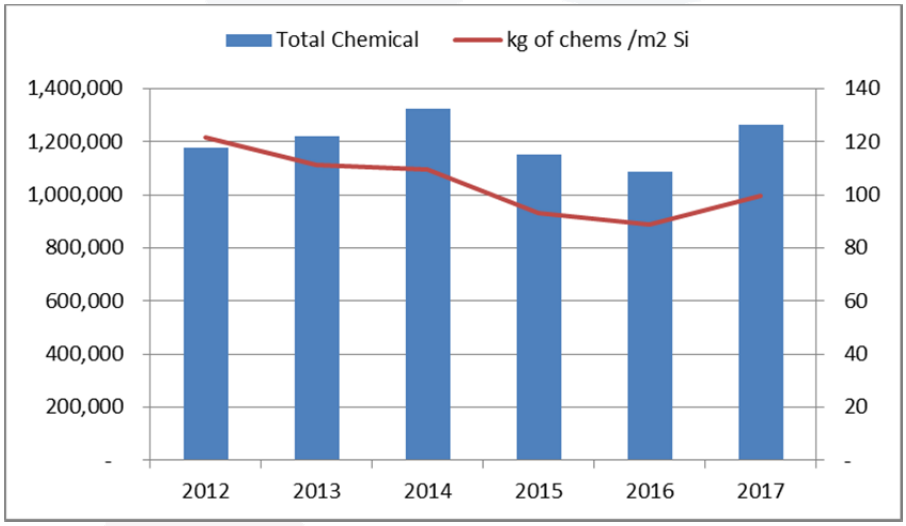
Solvent Usage Trend Data

Silicon wafer output rose slightly in 2017 compared with 2016, showing an increase of 4%. During this period the quantity of chemical used rose by 16% and solvents by 30%. Solvent waste has increased by a similar amount.

This was due to a product mix change which resulted in:

- the silicon wafers that we output having a greater number of layers;
- a more intensive back end process which is solvent rich.

The graph below shows the quantity of solvent used against the volume of production output (measured in square metres of silicon) and versus the total quantity of all chemicals.



Conclusion

Fugitive emissions from VOCs on NWF site are considered to be insignificant. We will continue to assess our on-site practices to ensure our emissions to atmosphere remain as low as practicable.

There has been no notification made under Section 5.1.1.2 of any significant fugitive emission.

Dust is not relevant to cleanroom operations.

Newport Wafer Fab Ltd
Facilities Department