IQE (Europe) Ltd (KP3235SS)
Fugitive Emissions Annual Review 2016

Solid Materials

Under normal operating conditions the MOVPE production tool will create a small amount of potentially toxic deposits within the reactor cell. These deposits are removed from the reactor cell during planned maintenance activities and are managed on site until sent for disposal via an appropriately registered contractor.

Parts are routinely removed from the reactor cells for cleaning by our own equipment engineers, these parts are bagged prior to transfer to the acid etch room. A small amount of toxic dust may be trapped in these transfer bags. These bags are disposed of via the appropriate hazardous waste stream.

All components are dis-assembled prior to etch cleaning within an extracted fume cabinet, >99% of the toxic deposits are captured and held in suspension within the acid etch solution.

Any residual particulates generated during the unpacking process prior to etching are captured within the local exhaust ventilation system filters. Waste etch solution is disposed of via the appropriate hazardous waste stream.

A small quantity of Gallium Arsenide (GaAs), Indium Phosphide (InP) or Germanium (Ge) particulates will be released during destructive testing of our semi conductor wafers. These particulates will be captured through laminar flow hoods and filters which keep the clean room at class 1000 conditions. These filters are disposed of as hazardous waste when replaced as part of the site PPM activities.

Phosphorus solids are produced as part of the manufacturing process and contained in phosphorus (p) traps. During maintenance there is the potential for the phosphorus to ignite releasing phosphorus pentoxide smoke particles into the air. To minimise this and comply with BAT requirements, all orifices are capped using KF50 blanking plates to prevent oxygen ingress and ignition when maintenance activities are in progress.

All contaminated pipework, connectors and P-traps are collected from site, cleaned and returned via external specialist service providers.

There have been no reported instances of solid fugitive releases during the period from 1st January 2016 – 31st December 2016.

Liquids

Any release of evaporating solvent fume from our very small consumption of Isopropyl alcohol (IPA) will be captured within the LEV systems of the chemical work-stations. Activated charcoal filters will prevent the solvent from being released to atmosphere.

During maintenance of our scrubber systems it is possible for small quantities of Sodium Hypochlorite/ Phosphoric acid / Sodium Hydroxide to be spilt. The scrubbers are housed within the building and the entire system is bunded to contain any drips from removed pipe work.

Accidental spillage of any chemical held on site is always a possibility. IQE Europe has many readily available spill kits which are used in line with documented work instructions or procedures to control any activities where such a spillage may occur. This minimises the likelihood of any fugitive release to the environment.

Liquid raw material delivery systems are used to transfer Sodium Hypochlorite and Sodium Hydroxide from the external bulk storage tanks to the internal scrubber holding tanks.

To prevent fugitive emissions from these systems the following methods are used:

- The bulk storage tanks are of double wall construction and protected by a tertiary bund.
- The secondary containment hatches fitted to the tanks are removed on a daily basis and internal checks are made as part of our site protection and monitoring program (SPMP).
- The tertiary containment is checked on a daily basis as part of our SPMP.
- Both tanks are subject to periodic examinations (external and internal) in line with the requirements of BS4994.
- The chemical transfer pipes from the bulk storage to the point of use are of double wall construction and contained within a tertiary trench.

The waste compound is used to store all hazardous waste streams prior to pre-arranged collection. All liquid waste streams are colour coded/segregated to prevent accidental mixing or unwanted reactions occurring. The compound itself is bunded to contain any residue should the primary containment fail.

There have been no reported instances of liquid fugitive releases to the environment during the period from 1st January 2016 – 31st December 2016.

Gases

The toxic gas delivery systems on site are of pipe within pipe (co-axial) construction and the entire production area is continuously monitored by Honeywell toxic gas detection systems.

In the event of a gas detection event exceeding 100 parts per billion (ppb) the safety control system is activated, this in turn shuts down the reactor, isolates the gas supply to the system and puts the equipment into a nitrogen purged base state (safe condition).

These systems have in built double redundancy and are regularly tested as part of our preventative maintenance program. The results of these testing activities and any intentional operation are reported as key process safety performance indicators to the IQE Senior Management team and Board of Directors on a quarterly basis.

In the highly unlikely event of a complete system failure all systems are designed to “fail safe” i.e. power is isolated, all gas systems are isolated and the reactors default to a nitrogen purged safe base state.

There have been no reportable fugitive emissions via the main site stack to atmosphere during 2016.

IQE believes that it is currently compliant with BAT with respect to fugitive emissions. This will be reviewed next year and the results forwarded to Natural Resources Wales by 31st March 2018.