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| **Non-Technical Summary** | |
| **Action area** | Production of Polyurethanes systems and binders using a prepolymer |
| **Overview of Activities** | Vacuum Distillation Process and Blending process (using a prepolymer) |
| **Operating Techniques** | Vacuum Distillation Process and Blending process  Dispersing powders in organic solvents, providing heat from the steam generation boiler system, place the vessel under vacuum for a short period of time allowing some of the solvents to be distilled into another vessel.  Moisture content is identified by process testing.  The mixture is cooled using a closed loop chilled water system and prepolymers are added along with more powders and solvent.  Vacuum is applied to remove any entrenched gases and a moisture trigger agent and dilute with solvent to meet the viscosity spec.  The product is packed down into 15L open top tins under Local Exhaust Ventilation. |
| **Raw Materials** | IPDI and TDI prepolymer are purchased ready mixed for the process.  Xylene is added as a solvent.  Powders are delivered in 25kg bags and added to a hopper with an LEV system to filter media.  All liquids are delivered in drums and IBC’s.  Biocide is provided in power form in 25kg bags. |
| **Waste from the process** | Xylene distillate is produced and reused for vessel washing. Waste xylene is ~9% of the product batch.  The Xylene is contaminated with 10% solids and is sent for recovery with a licenced waste disposal company.  On a rare occasion, if a batch falls outside of the agreed specification and cannot be reworked it will be disposed of as Hazardous Waste with a licenced waste disposal company.  The waste quantities produced are monitored and assessed for anomalies and efficiency of use. |
| **Water use** | Water is provided to the site from the mains supply. Water is not used for processing or routine cleaning.  Water is used for Fire Prevention in the Sprinkler system.  Water is used as boiler feed water and undergoes chemical treatment and water softening as part of the boiler water treatment process to prevent scale build up, reduce oxygen and increase boiler system longevity.  Water is used as chiller water for cooling processes and undergoes chemical treatment as part of a chiller water treatment process to prevent scale build up and system corrosion.  Vessel wash water from non-routine specialist cleaning processes is collected for offsite disposal.  Water meters are going to be installed to allow for regular monitoring. |
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| **Point source emissions to air** | There is a condenser on the vessel on the vacuum system catch pot and the exhaust on the vacuum pump is the point source. The main emission is Xylene vapours.  There will be less significant levels of TDI and IPDI vapours drawn from the process.  LEV’s at the vessel manhole, packdown point, sample point and at charging station for raw materials with the same emissions as the vacuum pump exhaust.  Inorganic powders in dust emissions are through a LEV filter media which is changed regularly.  Biocide powder in dust emissions are through a LEV filter media which is changed regularly.  NOX from the boiler process as the primary emission as well as SOX and dust from the boiler flue.  Diesel powered FLT operations will emit NOX, SOX and dusts.  Insignificant Nitrogen release from the process from the Nitrogen generator. |
| **Fugitive emissions to air** | LEV’s will cover any fugitive emissions at the charging stations. Spills will be minor and be cleaned up promptly. |
| **Monitoring of emissions to air** | The site operates one gas-oil fired boiler which provide steam to the process.  Performance monitoring (as opposed to compliance monitoring) of the emissions to atmosphere from the boilers is currently undertaken as part of an annual service by site-based technicians, to ensure that efficient operation of the plant continues.  Additional boiler monitoring using MCERTS equipment will be measured later in 2022 to benchmark compliance to the Medium Combustion Plant Directive (MCPD) and the associated monitoring schedule from 2030.  Impact assessment screening of the point source emissions to air and water has been undertaken using the EA H1 Environmental Impact Assessment software and guidance. All emission points are listed in the Emission Points document |
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| **Point source emissions to surface water** | Boiler jacket vessel purging water. |
| **Fugitive emissions to surface water** | Vacuum pump water tank closed water system – overflow. Will contain small amounts of Xylene and captured in a drum and sent off site for disposal with a licenced waste disposal contractor. Chiller water tank overflowing (dosed with water treatment chemical). |
| **Point source emissions to sewer** | There are no emissions to sewer. |
| **Monitoring of emissions to water** | Not required. |
| **Emissions to land** | No emissions to land from the installation. |

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| **Odour** | The manufacturing process is within a building. The LEV exhausts at the rear of the building. The Condenser exhausts to the tank farm bunding area. There are carbon filter drums before being discharged to air. There is no discernible odour. |
| **Noise & Vibration** | No noise complaints have been received. |
| **Energy** | The primary sources of energy used at the installation are electricity imported from the National Grid and Gas-Oil to power a boiler to generate process steam.  Half hourly meters are installed on the site across the site to record electricity usage. Gas-Oil consumption is measured through the purchase order system and visual tank levels. The readings and consumption levels are tracked, looking for anomalies and efficiency of use.  The boilers will fall under the Medium Combustion Plant Directive (MCPD) (2015/2193) as they are rated at 2.27MW and they will need to be registered by 1st January 2029 (and meet the MCPD Emission Limit Values by 1st January 2030) the application to this directive is included with this Environmental Permit application. |
| **Environmental Management system** | The installation operates under an environmental management third party certification scheme to ISO14001:2015.  The process is supported with a management consultant who carries out compliance audits. |
| **Environmental Risk Assessment** | An Environmental Risk Assessment has been undertaken as part of the installation permit. |
| **Incident Management** | Written procedures are in place to manage the identified risks, including procedures relating to spill response, emergency preparedness and response to major emergencies. The Site has a Major Incident Plan and a Fire Prevention Plan which outlines the processes to follow to ensure adequate systems, resources and training are in place to effectively prevent and minimise the impact of an incident. |