Odour Treatment Technologies for Sewage Odours

TECHNOLOGY	Process Description	Filter media	Odour Removal Efficiency	CAPEX	OPEX	Limitation
BIOFILTER	Odorous air is passed through a humid packed bed of natural organic material. Compounds in the air are transferred to a biofilm of microorganism growth on the media which then decompose into cell material, CO2 and water. Nutrients needed for the growth of microorganisms are supplied by the organic matter	Fully natural organic material	Excellent	Average	Low	• Large space required • Pre-scrubber unit required before Biofilter to maintain humidity in biomass, regulate pH level and act as a buffer against concentration peaks
BIOTRICKLING FILTER	Odorous air is passed through a packed bed of chemical inert/ inorganic material wetted by a continuous or intermittent spray of recirculated wash water in counter-current to the odorous gas flow. Compounds in the air are similarly decomposed by a biofilm of microorganism growth on the media. Nutrients needed for the growth of microorganism are added externally through the recirculated wash water.	Chemical inert / inorganic material	Poor	Average	High	• Difficult to continuously maintain the biofilm of microorganism on the media surface • Addition of nutrient required • Excessive growth from microorganism activities may lead to media plugging. • High water usage to dilute effluent for acceptable water wash quality before • pH control required
BIOSCRUBBER	Consist of two reactors. First reactor is identical to a Biotrickling filter. Second reactor is similar to an activated sludge unit where microorganism growing in suspended flocs degrade the pollutants that have been absorbed by the effluent of the Biotrickling filter	Chemical inert / inorganic material	Average	High	High	• Difficult to continuously maintain the biofilm of microorganism on the media surface • Addition of nutrient required • Excessive growth from microorganism activities may lead to media plugging • pH control required
WET CHEMICAL GAS SCRUBBER	Odorous air is passed through several packed beds of chemical inert/inorganic material wetted continuous by sprays of recirculated scrubbing chemical media. Specific identified chemical compounds in the odorous air are absorbed and chemically treated over multiple stages with different chemical treatment in each stage.	Chemical inert / inorganic material	Poor	Average	Very High	• Handling of scrubbing chemicals hazardous and require qualified personnel. • Additional chemical treatment system required for srubbing media effluent wastes.
ACTIVATED CARBON ADSORBER	Odorous air is passed through a bed of solid adsorbers, typically granulated activated carbon. Compounds in the air are adsorbed onto the activated carbon until saturation	Activated carbon	No removal, only storage	Low	High	• Saturation time is unknown. • Typical local installations require media replacement within 6 months. • Saturated carbon disposal regulated under EQA Scheduled Waste.