Filtrační Technika

Direct Fired Thermal Oxidizer - DFTO

Synthesia, a chemical industry company, had to resolve the liquidation of emissions from its current production of carbodiimides. The preparation of the production consists in a reaction of the intermediate product with the excess phosgene in the environment of toluene as a solvent. All the relief gases from the production of carbodiimides containing high concentrations of toluene, as well as small quantities of phosgene and hydrogen chloride, are the subject of the emissions removal.

Given the relatively low flow of exhaust gases and high, nearly explosive, concentrations of toluene and the presence of other hazardous pollutants, direct thermal oxidation technology was selected for the emissions removal. Waste gas is brought directly into the oxidation chamber, where the destruction of hazardous pollutants takes place at high temperature. The removal efficiency of hazardous polutants is higher than 99%.

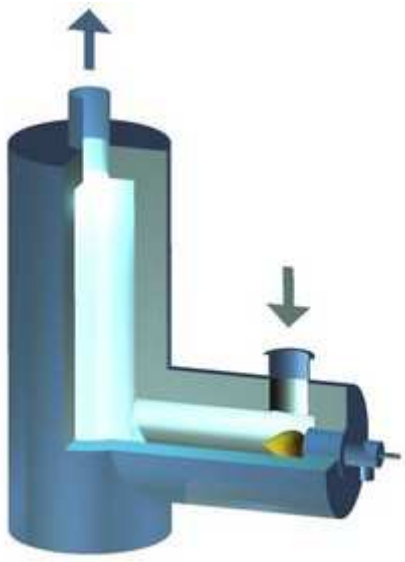

Figure 1 Illustration figure of DFTO

The key to safe operation of the equipment at very high concentrations of toluene is in monitoring the content of oxygen at the inlet into the oxidizer and keeping it below the safe level by means of inert gas. With regard to the environmental risks, appropriate analysing equipment is installed on the chimney to monitor the concentrations of phosgene and hydrochloric acid.

The real challenge in designing the equipment was the choice of a suitable refractory insulation, given the very aggressive environment. The resulting design using refractory concrete shaped bricks complies with the refractory insulation's high demands for resistance and service life of the refractory insulation. The advantage of the refractory concrete shaped bricks is, of course, their tempering before the actual installation which significantly decreases the installation period and therefore the shut-down period of the production technology as well.

The result of this project is the successful reduction of emissions of dangerous compounds during the production of carbodiimides at the Synthesia company.