

Thermoreact® - An Innovative Remediation Product for In-Situ Neutralization of Halogens, Sulphur, Phosphorus and Mercury during Thermal Desorption

Ysaline Depasse¹, Aline Jorden², Hatem Saadaoui³, Jan Haemers⁴

¹²³⁴Haemers Technologies SA

Chaussée de Vilvorde 104, Brussels, Belgium

Ysaline.depasse@haemers-tech.com; aline.jorden@haemers-tech.com; hatem.saadaoui@haemers-tech.com;

jan.haemers@haemers-tech.com

Extended Abstract

During In Situ Thermal Desorption, polluted soil (generally with TPH, PAH, Mercury, chlorinated solvents, etc.) is heated until vaporization of target contaminants is reached out of the soil. This results in the vaporisation of those pollutants, which are then drawn through perforated steel tubes, called vapor tubes, surrounded by gravel acting as a draining medium preventing the clogging of the tube perforations (by fine particles, sludge, etc.). These recovered vapours are then either treated in a vapour treatment unit or re-injected into the flame (in case of hydrocarbon pollution and heating with smart burners).

In many cases, the pollutants to be treated in the soil are accompanied by other process-disturbing elements (such as phosphorus, sulphur or halogenated compounds like chlorine). The heat causes the vaporization of many chemical compounds, including those disruptive compounds that are conducted through the porous medium to the extraction wells. The problem with these disruptive compounds is that in some cases they become very corrosive and therefore tend to destroy equipment and render the remediation technology less effectively. Additionally, if not treated, they can cause non-compliant air emissions as well.

Thermoreact® is an innovative product that replaces the conventional gravel around vapour tubes. The product allows for in-situ neutralization of the vapors before exiting the soil pack, reducing the treatment requirements and saving substantial treatment costs overall.

Its composition varies in function of the pollutants present in the soil in order to always obtain the best neutralization reaction while keeping permeability at the required level for proper vapor extraction.

The products of said neutralization are inert minerals that can be left in the soil, making In Situ Thermal Desorption a truly zero-waste treatment for many more contaminants than is currently the case.

The paper presents the results of various tests and cases where In Situ Thermal Desorption has been adapted to use Thermoreact® instead of conventional gravel. Before and after results are compared.