**About Thermal Desorption Plant**

The plant has been used to treat contaminated soil with difficult pollutants. It consists of a rotation drum and indirect introduction of heat. The gas is burned in an after-burning unit at high temperature. Exhaust gases are used for pre-heating and drying.

- Plant has been in use since 2002.
- It is transportable. (advantage and enables in situ treatment where contaminated soil masses don’t need to be relocated).
- Currently located at Mustankorkea landfill area at Jyväskylä, Finland.
- Re-installation of the apparatus takes one week after transportation to the new target site.
- The plant and all its accessories require about 35-50 square-meters of open space.
- The plant is capable of treating 10-40 tons of contaminated soil per hour.
- Design and construction of this plant was ~5 million euros in 2002.

**Thermal Desorption – An Environmentally Sound Process for Treating Contaminated Soils.**

In thermal desorption process contaminated soil is heated to a temperature, in which the pollutant is volatilized or decomposed. The gas from the process containing the contaminant is treated by and after-combustion process or by some other effective method.

Thermal purification methods are useful in removing weakly biodegradable matter. Most suitable soil types for thermal desorption are sand and gravel. Cohesive soil types might inconvenient to treat with this method. Water content has a great effect on heating process and energy consumption increases with water content. Drying of soil prior to treatment might be necessary. Fine-grained soil types have a high sorption capacity due to its great surface area and they can behave in a plastic manner.

Soils contaminated with volatile (VOCs) or semi-volatile (SVOCs) organic compounds are suitable for low-temperature thermal desorption (~100-300 Celsius). VOCs and SVOCs are typical in soils contaminated with different type of fuels. Cyanides, Mercury (Hg), Cadmium (Cd), lead (Pb) and Arsenic (As) are also quite easily evaporating substances (vaporization in low-temperature burning). Volatile heavy metals may render the purification of the burning gases.

Chlorinated organic compounds (such as PCBs and dioxins) and polyromatic compounds (PAHs) require higher temperatures. Intermediate (400-800 °C) temperature burning process is suitable for soil contaminated with the substances above. High-temperature processes (~1000 °C) are used for waste treatment, rarely for contaminated soil.

The heat may be brought directly into contact with the soil in the form of combustion gas from the energy source. In an indirect method the transportation equipment (a rotating drum, screw conveyer or chain conveyer) and the surrounding structures are heated.

The most critical stage in the process is the collection and treatment of the gases brought about by heating. Gas purification may include after-burning (at high temperature), catalytic burning, use of active carbon, neutralizing substances or corresponding. Particles must be mechanically filtered or washed out of the gas stream.
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KULJETUSTIEDOT
- kokonaispaino: 47000 kg
- akselipaino: 3x10000 kg
- paino vetoautolle: 17000 kg
- kuljetuskorkeus: 4,7 m
- kuljetusleveys: 3,7 m
- kuljetuspituus: 22,25 m

-Ev Kääntöä Pyörä-

**Table:**

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**KUMERA Technology Center**
FIN-1100 REHOME-FINLAND

**EcoCleaning**
SAPSTUNEN MAAN POLTTOUKIN

**Drawing title:** Pyorive polttouuni, kuljetus

**Sheet:** 334337 1/1

**Scale:** 1:100

**Drawn:** 2002-06-18

**Revision:**
KULJETUSTIEDOT

- kokonaispaino: 15000 kg
- akselipaino: 2x5000 kg
- paita vetoautolle: 5000 kg
- kuljetuskorkeus: 4,37 m
- kuljetusleveys: 2,71 m
- kuljetuspiiruus: 12,75 m
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KULJETUSTIEDOT
- kokonaispaino: 24400 kg
- akselpaino: 2x7600 kg
- paito vetoautolle: 9200 kg
- kuljetuskorkeus: 5,0 m
- kuljetusleveys: 3,5 m
- kuljetuspituus: 18,0 m

REVISED

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KUMERA Technology Center
FI-11100 REINHAIN - FINLAND
Project/Project: ECOCLERNING
SAARSTUNEN MAAN POLTTOUNI

Drawing title: Polynpoistoyksikko, kuljetus

Revision: 1/1

Drawing No.: 334339

334339 2002-06-18 15:31
KULJETUSTIEDOT
- kokonaispaino: 57700 kg
- akselipaino: 4x11100 kg
- paino vetautolle: 13300 kg
- kuljetuskorkeus: 5,05 m
- kuljetusleveys: 3,5 m
- kuljetuspituuus: 22,25 m

Drawing No. 334338 1/1
Sheet 1/1
Revised: 2002-06-19