DEKKER
VACUUM TECHNOLOGIES, INC.
The Experts in Vacuum Solutions

APPLICATION BULLETIN

Soil and Ground Water Remediation

Call us today! 1-888-925-5444

The Dekker Solution to Soil and Ground Water Remediation

Purpose

Thousands of hazardous waste sites world-wide have released chemicals into the ground, contaminating soil and groundwater. Billions of gallons of groundwater are used for drinking water, agriculture and other important uses. Therefore, contaminants that remain in the groundwater and soil need to be removed.

Processes

Contaminants in soil may be removed in a vapor or liquid form by any of these three processes: Soil Removal, Soil Vapor Extraction (SVE) or Dual Phase Extraction (DPE).

Soil Removal is used when contaminants have not penetrated the soil deeply; it is scraped off the surface and deposited at another site. The soil could then be incinerated or vacuum could be used to assist contaminant removal.

In the **SVE process**, a low vacuum is pulled on the soil through pipes connected to a series of wells. This vacuum pulls the lighter, easily evaporated portions of the contaminants out of the soil. VOCs are then discharged to an incinerator or absorbed through carbon bed filters.

In the **DPE process** a higher vacuum (15 – 25" HgV) is used to remove both groundwater and vapors from the soil through the same process as described above: through pipes connected to a series of wells. During the process both contaminated groundwater and VOCs are being treated to remove contaminants.

The Dekker Solution

The Vmax Oil-Sealed Liquid Ring Vacuum Pump System from Dekker Vacuum Technologies, Inc. has gained wide acceptance as the system of choice when a higher level of vacuum is required to remediate contaminated sites with tight soil formations. The higher level of vacuum allows the user to more effectively pull Volatile Organic Compounds (VOCs) out of the soil. Typically, the Vmax is used when a vacuum level of 15 – 25"HgV is required.

Maximize efficiency on your system with the Vmax^{VFD} (Variable Frequency Drive) and reduce operating cost.

Complete Dekker Remediation System Solution.

Dekker Vmax System with knock-out tank.

935 SOUTH WOODLAND AVE., MICHIGAN CITY, IN 46360-5672 **www.dekkervacuum.com**
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Benefits

Ability to Remediate Tight Soil Formations
Using high vacuum expands the ability of remediation companies to clean even the toughest sites, including those with tight soil formations.

Reduced Remediation Time
Using high vacuum on remediation wells dramatically increases groundwater and VOC extraction rates over other technologies by a factor of as much as 10. Total remediation time is now measured in a few years as opposed to a few decades when using older technology.

Flash Off Quicker
When using high vacuum, some VOCs can be stripped off contaminated groundwater before extraction, which reduces treatment costs due to lower concentration of organics in the groundwater.

Higher Concentration of VOC in Inlet Stream
Using high vacuum, the VOC concentration in the inlet stream is significantly higher which in turn optimizes carbon absorption equipment. The higher VOC concentration also allows different downstream equipment to be used effectively such as thermal or catalytic oxidizers.

Ability to Endure Process Upsets
The Vmax System is the most rugged vacuum pump available for this tough application. When ground water or silt is pulled into the Vmax during a process upset or inlet knockout tank overflow, the Vmax can be cleaned and flushed and put back into service. Most other vacuum pumps would experience catastrophic failure when this occurs.

VOCs Pass through the Vmax System
The Vmax System operates in the 170° – 180°F range. At that level the majority of the VOCs do not condense in the oil, but rather pass through the Vmax. Although some VOCs have high vapor pressures which may condense in the oil, pump bearings are not affected due to their location outside the pumping chamber. In addition, the oil acts as a protective coating to internal components to prevent corrosion associated with dry pumps.
Other oil lubricated pumps such as rotary vane or rotary screw have internal bearings which will be susceptible to failure due to contaminants.

Low Noise Level
The Vmax System is exceptionally quiet operating at less than 82 dBA. Low noise level is very important when remediation sites are located close to residential areas.

Dekker Solutions

Vmax

AquaSeal

System Specifications

Dekker System or Pump:
- Vmax Oil-Sealed Liquid Ring Vacuum Pump System
- Aqua Seal Water Sealed Liquid Ring Vacuum Pump System

System Capacity:
- 30 CFM – 6000 CFM with vacuum level of 15-28 inches HgV gauge

System Components:
- TEFC, XP, Class 1 Div 1 or Class 2 Div 2 compliant components
- High temperature thermal mixing valve
- Inlet air filter
- Vacuum relief valve
- Knock out tank with transfer pump
- System telemetry for remote monitoring

Vmax Advantages:
- Full 3-Year Warranty
- Sealed external bearings for damage protection
- Patented, high-efficiency DX-5 separator eliminates oil carry-over concerns
- Rugged, high-quality industrial system offering years of trouble-free operation
- Extended life seal-fluid is not used as a lubricant. 10,000 hours of continuous operation
- Extremely low operating noise level makes this system desirable in today's workplace
- Carry-over of soft solids and/or minimal amounts of liquid does not cause damage to internal parts of the pump
- Air-cooled design, no cooling water required, resulting in substantial savings.
- Now available with optional Variable Frequency Drive, resulting in lower power consumption.

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