

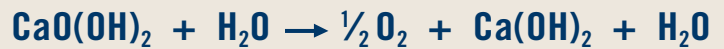


Highest amount of active oxygen in a controlled-release, oxygen producing compound

PRODUCT OVERVIEW

ORC Advanced® is the state-of-the-art technology for stimulating aerobic bioremediation. It offers unparalleled, maximum oxygen release for periods up to 12 months on a single injection and is specifically designed to minimize oxygen waste while maximizing contaminated site remediation.

ORC Advanced is a formulation of calcium oxyhydroxide which, upon hydration, releases oxygen and forms simple calcium hydroxide and water.



PRODUCT BENEFITS

HIGHEST AVAILABLE OXYGEN CONTENT

More active oxygen (17%) plus Regenesi's patented controlled-release technology (CRT™) saves time and money by increasing degradation rates and improving remediation performance by providing more oxygen on a single injection. It is particularly effective at higher demand sites where oxygen may be limited and scavenged by competing carbon sources.

PATENTED CONTROLLED-RELEASE TECHNOLOGY (CRT™)

Based on the same proven technology employed in the industry standard Oxygen Release Compound (ORC®), CRT allows for an efficient, long-term release of oxygen providing the optimal conditions for sustained aerobic biodegradation. This can save time and money by reducing the potential need for multiple applications. Also, oxygen release "lock-up" is avoided – an unfortunate problem experienced with commodity chemicals.

IN SITU APPLICATION

Remediation with ORC Advanced is typically more cost-effective than *ex situ* treatments. With the use of ORC Advanced there is minimal site disturbance with no above-ground piping or mechanical equipment, no operations and maintenance costs and no hazardous materials handling or disposal.

PRODUCT BENEFITS

DEFINING THE SCIENCE BEHIND CONTROLLED-RELEASE TECHNOLOGY (CRT™)

Early on, Regenesi's researchers noted that in order to optimally stimulate the natural attenuation of aerobically degradable contaminants, biologically usable oxygen was best supplied in low but constant concentrations. Big bursts of oxygen are wasteful and simply "bubble off", often generating undesirable foaming and producing unwanted preferential flow paths in the subsurface. Regenesi's sought to solve this problem by controlling the rate of oxygen release from solid oxygen sources.

The answer was provided by the development of CRT. The CRT process involves intercalating (embedding) phosphates into the crystal structure of solid peroxygen molecules. This patented feature, now available in the ORC Advanced® formulation, slows the reaction that yields oxygen within the crystal, minimizing "bubble off" which can waste the majority of oxygen available in common solid peroxygen chemicals.

CRT provides "balance" – it slows down the rate of oxygen release while at the same time preventing "lock-up". Commodity solid peroxygen chemicals, when in contact with water, will produce an initial rapid and uncontrolled-release of oxygen. Then, as hydroxides form, a significant portion of the oxygen deeper in the crystal is made unavailable or becomes "locked-up." This undesirable effect is inefficient and costly. CRT prevents lock up and controls the rate of oxygen release, representing the state-of-the-art technology in passive oxygen delivery.



FIGURE 1:
FILLING A PUMP WITH
ORC ADVANCED SLURRY

CRT

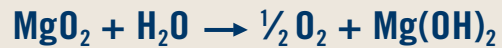


The original controlled-release oxygen compound, since 1994



The original Oxygen Release Compound (ORC[®]) is a fine, powdery material comprised of a patented formulation of phosphate-intercalated magnesium peroxide. The intercalation or embedding of phosphates within the magnesium peroxide is RegenesiS' patented, controlled-release mechanism.

Upon hydration, ORC is designed to produce a controlled-release of oxygen (10% by weight) into the subsurface in accordance with the following reaction:



This process can proceed for periods of up to one year depending on site conditions. In the presence of this long-lasting oxygen source, aerobic microbes flourish - accelerating the naturally slow rates of aerobic biodegradation.

PRODUCT OVERVIEW

PRODUCT BENEFITS

BENEFITS

By enhancing bioremediation using ORC, in situ treatment of contaminants can result in an efficient, simple and cost-effective alternative to traditional technologies. With low capital costs, no operations and maintenance, minimal site disturbance and proven effectiveness, ORC can restore water quality and property values at a reasonable cost.

MATERIAL APPLICATION

Most contaminated sites are treated using ORC slurry which is a prescribed and easily injectable water and ORC mixture (Figure 2). The direct - injection of ORC slurry maximizes ORC and oxygen distribution in the subsurface increasing the range of enhanced biodegradation. ORC is dosed in pounds per vertical foot of material treated. The amount of ORC recommended depends greatly on various factors such as contaminant concentrations, oxygen sinks, groundwater flow rates and subsurface geology. It is recommended that a RegenesiS Technical Services Representative be contacted for detailed design information.

ORC treatment approaches or designs may consist of one, or combinations of the following: Source Area Grids, Plume Area Grids or Barriers, Excavations and Biopiles.

SUBSURFACE EMPLACEMENT

- Direct – Push Injection
- Hollow Stem Augers
- Existing Wells
- Recirculating Wells
- Replaceable Filter Socks (existing wells)
- Excavations
- Trenches

PRODUCT APPLICATION

TREATABLE CONTAMINANTS

CONTAMINANTS

ORC can treat a wide range of contaminants and most any aerobically degradable compound including: gasoline and fuel additives (BTEX and MTBE), diesel, kerosene, jet fuel, gas condensates, fuel oils, lubricants, bunker oil, PAHs, certain metals (arsenic), certain pesticides/herbicides and certain industrial solvents (alcohols and ketones).



FIGURE 2: ORC SLURRY