



Element Six Launches its Diamox Technology for the Electrochemical Treatment of Highly Contaminated Wastewater

SANTA CLARA, Calif.—April 18, 2016—[Element Six](#), the world leader in synthetic diamond supermaterials and member of The De Beers Group of Companies, today announced the next generation of its Diamox electrochemical advanced oxidation cell technology. Diamox is a cost effective and highly efficient wastewater treatment electrochemical cell, designed using free-standing boron doped diamond electrodes. Diamox is effective in treating extremely contaminated industrial wastewater that cannot be treated by biological methods. This packaged reactor is simple to implement in to on-site industrial wastewater treatment systems, providing an environmentally cleaner and versatile solution that can be used across various types of effluents, with no hazardous chemical additions. The latest design of Diamox has been successfully applied in a pilot project with an industry-leading wastewater treatment company, delivering unparalleled electrochemical oxidation capacity that can be scaled to meet industry requirements.

Diamox is born from more than 20 years of research into electrochemical oxidation, leveraging boron doped diamond (BDD) and expertise from Element Six in manufacturing and engineering synthetic diamond supermaterials. When heavily doped with boron, diamond becomes a metal-like conductor, while retaining all of its physical properties making it the most chemically inert and robust electrode material available. Diamox contains high-purity, electrically-conductive, free standing polycrystalline BDD electrodes that have a field lifetime measurable in years in electrochemical treatment conditions that no other electrode materials can withstand for even a few hours. These specialized diamond electrodes generate hydroxyl radicals and many other oxidizing species, enabling advanced oxidation processes that are capable of mineralizing dissolved pollutants in wastewater streams.

The latest Diamox technology has been significantly redesigned with increased capacity and improved efficiency for more cost-effective treatment of waste streams. Through a combination of increasing the electrode area, and the power density that the cell operates at, the new 20 cell version has five-times the oxidation capacity of earlier generations. Diamox is a small footprint packaged product that can be scaled in size for incorporation into any existing or new industrial water treatment plant – enabling on-site treatment systems that are simple to operate and maintain. Diamox also has the versatility to work with most effluents—an advantage over other advanced oxidation processes that only treat specific types of waste.

Diamox was recently leveraged in a successful pilot project by an industry leading wastewater treatment company for use in treating highly contaminated spent caustic streams, such as those generated by refineries producing clean fuel. In a series of treatment studies Diamox was proven for different mixed spent caustics from a refinery process to reduce the chemical oxygen demand (COD) by over 90 percent with an output that is safe to discharge into the environment.

Diamox technology has been successfully used for the treatment of pharmaceutical wastewater, textile dye house wastewater treatments, and refinery spent caustics treatment. It provides a cleaner solution for the environment compared to alternatives such as deep well injection, incineration, or hydrogen

peroxide advanced oxidation. Wastewater treated with Diamox provides an opportunity for direct discharge or reuse of the water and, unlike other electrochemical advanced oxidation processes, there is no additional chemical dosing with hazardous chemicals.

"Element Six is continuously pushing the boundaries of the properties of diamond to achieve ever higher levels of performance for our customers. By harnessing diamond electrodes for the efficient electrochemical advanced oxidation process, we have filled a market void for our customers with a commercially feasible and longer lifetime solution," stated Steve Coe, executive director, commercial and marketing at Element Six. "This new generation of Diamox offers an innovative and inherently safe method of advanced water treatment technology. Its strength against even the most formidable industrial wastewaters has triumphed, which is underscored by the impressive results achieved by our partners."



Diamox electrochemical cell for on-site wastewater treatment

For more information about Element Six Technologies, please visit www.e6.com/Diamox. Media interested in speaking with an Element Six spokesperson can contact e6@havasformula.com.

About Element Six

[Element Six](#) is a synthetic diamond supermaterials company. Element Six is a member of The De Beers Group of Companies, its majority shareholder. Element Six designs, develops and produces synthetic diamond supermaterials, and operates worldwide with its head office registered in Luxembourg, and primary manufacturing facilities in China, Germany, Ireland, South Africa, U.S. and the U.K.

Element Six supermaterial solutions are used in applications such as cutting, grinding, drilling, shearing and polishing, while the extreme properties of synthetic diamond beyond hardness are already opening up new applications in a wide array of industries such as optics, power transmission, water treatment, semiconductors and sensors.

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