



Q: Is AZOMITE[®] contaminated with hazardous chemicals; e.g., PCBs and Dioxin-like substances?

A: The European Union's regulatory maximum upper limit for Dioxin/PCB contamination of a mineral feed additive is 1 TEQ (1 nanogram/ kilogram). None of the assayed raw materials in AZOMITE[®] have reached these limits.

The following are two separate assays prepared by independent contractor, Xenobiotic Detection Systems using the XDS-CALUX[®] (EPA method 4435) analytical biotechnology method developed to quantify dioxin-like chemicals. The "dioxin" family of chemicals are some of the most toxic chemicals known and include the polychlorinated dioxins (PCDDs), furans (PCDFs) and biphenyls (PCBs) but may also include the polybrominated dioxin/furans and biphenyls and mixed halogenated species.

XDS has a genetically engineered cell line that contains the firefly luciferase gene under trans-activational control of the aryl hydrocarbon receptor (patent # 5,854,010). This cell line can be used for the detection and relative quantification of AhR agonists. Our term for the in vitro assay is Chemical-Activated Luciferase Expression or CALUX[®] assay.

The most thoroughly studied and toxic member of the dioxin-like chemicals is 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD, dioxin). Many other members of the family of dioxin-like chemicals are quantified relative to TCDD, since this is the most potent activator of AhR-mediated gene transcription. This relative quantification is known as Toxic Equivalents (TEQs) or bio-TEQ and the results from the XDS-CALUX[®] assay provide a measure of bio-TEQs in a sample. By using a patented clean up method (US patent # 6,720,431) developed by XDS, it allows separation of PCBs from PCDDs/PCDFs so that it is possible to determine that portion of the total bio-TEQ in a sample that is due to each of these classes of compounds.

TEQ – a measure of the Toxic Equivalency (TEQ) of Dioxin-Like Chemicals (PCDDs/PCDFs and PCBs) in a sample in parts per trillion (ppt)

Parts per trillion (ppt) = 1 gram in 1,000,000,000,000 grams. The lower limit of detection is 0.1 ppt.

Samples Examined in late 2011

XDS sample ID#	Client sample ID#	TEQ (ppt)	
		PCB	Dioxin(PCDD/F)
A08836	Mine Run 8_11_a	<0.1	<0.1
A08837	Mine Run 8_11_b	<0.1	<0.1
A08838	Mine Run 8_11_c	<0.1	<0.1

Therefore, neither of these three composite samples of AZOMITE[®] showed any evidence of contamination with Dioxin and Dioxin-like chemicals. Mine Run # 8 was sufficient in size to produce all AZOMITE[®] sold during 2012 and most of 2013.

Samples Examined in late 2009

A07790	09-1101a	0.13	0.59
A07791	09-04001a	0.16	0.44
A07792	09-02001a	0.09	0.55
Average		0.126	0.526

**For questions regarding these results, or the methods that were used, please contact XDS at (919)-688-4804 or visit www.dioxins.com.