



Technology Fact Sheet for Blue-Zone Deltane™ Technology Blue-Zone Technologies Limited

Performance Claim

Desflurane, isoflurane and sevoflurane, are inhalation halogenated anesthetic agents commonly used in surgical procedures. These potent Greenhouse Gases are routinely vented to the atmosphere through a scavenging system. By attaching a Deltasorb™ canister containing Deltazite™ adsorbent to the outlet port of the scavenging system, these valuable medical gases can be removed from the vented air stream by adsorption, and subsequently purified to medical standards.

Following procedures in Blue-Zone's "Reclamation Run Manufacturing Work Order, version July 11, 2005", these anesthetic agents were desorbed from the Deltazite™ adsorbent by purging full Deltasorb™ canisters with hot nitrogen gas, followed by cryogenic condensation into a liquid mixture. Using Blue-Zone's Deltane™ separation process "Distillation Run Manufacturing Work Order, version July 18, 2005", the performance claim for purity of these anesthetics is:

- a) For desflurane, conformance to the purity specifications of "USP 28 – NF 23 Supplement 1 Specifications", with 95% confidence.
- b) For desflurane, conformance to the specifications for non-volatile residue, antimony, fluoride and related compounds of "USP 28 – NF 23 Supplement 1 Specifications".

Technology Application

The Deltane™ Technology is a product and process combined which traps, recovers and purifies otherwise vented, anesthetic agents used in hospitals and veterinary clinics to medical standards, thus extending their life cycle. A cartridge invented by Blue-Zone traps anesthetic agents from operating room machines. This cartridge is returned to Blue-Zone where the trapped agents are desorbed and recovered. The recovered agents are then purified to USP standards for use as anesthetics. The claim is only for the recovery of one anesthetic chemical (desflurane).

Performance Conditions

The Deltasorb™ canister removed the three commonly used anesthetic agents, Desflurane, isoflurane and sevoflurane, from the vent air-stream of the anesthetic dispensing machine. Following procedures in Blue-Zone's "Reclamation Run Manufacturing Work Order, version July 11, 2005", these anesthetic agents were desorbed from the Deltazite™ adsorbent by purging full Deltasorb™ canisters with hot nitrogen gas, followed by cryogenic condensation into a liquid mixture. Deltane™ was separated from the removed gases by using Blue-Zone's Deltane™ separation process "Distillation Run Manufacturing Work Order, version July 18, 2005". The data on Desflurane purity was assessed under "USP 28 – NF 23 Supplement 1 Specifications".

Technology Description

The Deltasorb™ canister is mounted on the side of the anesthetic agent dispensing machine but is outside of the patient's breathing circuit. As the exhaled air stream containing anesthetic agents is being vented to the scavenging system, it is directed through the Deltasorb™ canister. The Deltazite™ adsorbent in the canister removes the three commonly used anesthetic agents desflurane, sevoflurane and isoflurane via adsorption. It reduces the quantity of potent greenhouse gases entering the atmosphere.

The saturated Deltasorb™ canisters are then picked up and returned to Blue-Zone's facility. According to the Blue-Zone's Standard Operating Procedure (SOP) each canister is processed first to obtain necessary information. They are then subjected to the reclamation process following SOP where all adsorbed anesthetic gases are recovered as a liquid mixture.

The next purification process is where each of the three anesthetic agents is separated into medical grade purity. Following SOP, the recovered liquid mixture is subjected to fractional distillation. Since these agents have different boiling points (desflurane is 23°C, sevoflurane is 58.6°C and isoflurane is 48.5°C), they condense out of the fractionation column at different temperatures, enabling the separation.

Verification

Verification was based on the report: Assay of Desflurane in Deltane™ Samples. The Report was prepared for Blue-Zone by Bodycote materials Testing Canada Inc. Report Number 04-11-1695 - Table 3. Verification was completed by Investigative Science Inc, using ETV General Verification Protocol (March 2000).

What is the ETV Program?

The Environmental Technology Verification (ETV) Program is a joint Environment Canada - Industry Canada initiative delivered by ETV Canada. The ETV Program is designed to support Canada's environment industry by providing credible and independent verification of technology performance claims.

For more information on the Blue-Zone Deltane™ Technology please contact:

Blue-Zone Technologies Limited
14-84 Citation Drive
Concord, Ontario, Canada
L4K 3C1
Contact: Ms Dusanka Filipovic
Phone: 905.761.1224 x22
Fax: 905.761.3371
dfilipovic@bluezone.ca

ETV Canada Contact Information:

ETV Canada
2070 Hadwen Road Unit 201A
Mississauga, Ontario
L5K 2C9 Canada
Tel: (905) 822-4133
Fax: (905) 822-3558
E-mail: etv@etvcanada.ca
www.etvcanada.ca



Limitation of Verification

Environment Canada, ETV Canada, and the Verification Entity provide the verification services solely on the basis of the information supplied by the applicant or vendor and assume no liability thereafter. The responsibility for the information supplied remains solely with the applicant or vendor and the liability for the purchase, installation, operation (whether consequential or otherwise) is not transferred to any other party as a result of the verification.