DRAFT

"The attached draft information is provided as a tool for organizations developing their own means for evaluating medical waste treatment technologies. This information is provided only as a framework and is not for distribution and should not in any way be interpreted or represented as an official EPA document or test protocol."

RADIOFREQUENCY IRRADIATION

DESCRIPTION: Large radiofrequency irradiation medical waste treatment units include an initial destruction phase. The waste is automatically fed into a waste grinding device where it is shredded and sprayed with steam to increase the moisture content of the waste to approximately 10 percent. The moist ground waste is then heated by exposure to radiofrequency irradiation. This process heats the waste to >90 °C.

OPERATING PARAMETERS: The factors which affect radiofrequency irradiation treatment of medical waste include the frequency and wavelength of the irradiation, the duration of the exposure, destruction and moisture content of the waste material, temperature achieved throughout the waste load during treatment, and waste storage duration.

WASTES SUITABLE FOR TREATMENT BY RADIOFREQUENCY IRRADIATION: Radiofrequency irradiation treatment units can treat most infectious waste with the exception of cytotoxic, hazardous, or radioactive wastes. Contaminated animal carcasses, body parts, human organs, and large metal items may also be unsuitable for treatment by RF irradiation.

INDICATOR ORGANISMS: Thermally resistant indicator organisms are selected to provide a maximum challenge. *Bacillus subtilis* (globigii) ATCC 9372 (10^4) may be used to demonstrate a 4 $\log_{10}$ reduction of viable spores.

TEST PROCEDURE: Dried test spores are placed in a steam permeable container and added to the waste containers after the waste is ground and sprayed with steam but before exposure to RF irradiation. The waste is moved through the RF unit which is operated under normal conditions. The waste containers are then stored for a period of approximately 4 hours prior to disposal. At the conclusion of the irradiation and storage cycle the test organisms are removed from the waste and recovered within 24 hours. To recover the test organism the test discs or strips should be aseptically inoculated into 5.0 mL soybean-casein digest broth medium (or equivalent) and incubated for at least 48 hours (30 °C for *B. subtilis*). At the end of the incubation period the media should be examined for turbidity as a sign of bacterial growth. Any growth should be subcultured onto appropriate media to confirm the identity of the organism as the indicator organism or an environmental contaminant.