CLAIMS

1. A method comprising:

impinging a substantially inert gas on a first foil window of an electron beam horn while passing electrons through the window and inert gas while processing a cellulosic or lignocellulosic biomass material in particulate form on a conveyor;

while flowing the inert gas through an enclosed space defined by the foil window, which is in communication with a vacuum side of the electron beam horn, and a secondary foil disposed facing the first foil window under flow conditions that maintain the pressure inside the space between about 50 and 200 psi;

treating the inert gas to remove contaminants produced during processing of the biomass material; and

enzymatically saccharifying the processed biomass material to produce a sugar solution.

2. The method of claim 1, wherein the inert gas comprises nitrogen.

3. The method of any one of the previous claims, further comprising recycling the inert gas.

4. The method of claim 3, wherein recycling comprises impinging the substantially inert gas on the foil window more than one time before discarding it.

5. The method of claim 1, wherein treating the inert gas comprises filtering the gas.

6. The method of claim 1, wherein treating the inert gas comprises removing from the inert gas contaminants selected from oxygen, ozone, oils, particulates, water and mixtures thereof.