URBAN FORESTRY

Curtain Burner

Air Curtain Burners were designed principally as a pollution control device. The primary objective of an air curtain machine is to reduce the particulate matter (PM) or smoke, that results from burning clean wood waste. It is sometimes hard to visualize without seeing a machine in operation, but the machines do not burn anything, rather they control the results of something burning. You could look at it as a pollution control device for open burning. Clean wood waste is loading into the FireBox, and accelerant like diesel is poured on to the wood and the pile is ignited. Very similar to starting a campfire. The air curtain is not engaged until the fire has grown in strength or the air curtain may blow the fire out. Once the fire has reached suitable strength, usually 15 to 20 minutes, the air curtain is engaged. The air curtain then runs at steady state throughout the burning operations and the waste wood is loaded at a rate consistent with the rate of burn. The smallest machine will burn at a rate of ½ to 1 ton per hour, the largest machine can burn in excess of 10 tons per hour

PRINCIPLE: The purpose of the air curtain is to stall or slow down the smoke particles on their way out of the FireBox. In doing this the particles are subjected to the highest temperatures in the FireBox. Stalling the smoke particles in this region just under the air curtain causes them to re-burn, further reducing their size to an acceptable limit. The result is a very clean burn with opacities well under 10 on the Ringelmann scale (as compared to open burning which typically can run at 80 to 100 on the Ringelmann scale).

OPERATION For proper operation, the air curtain machine has to be designed to provide a curtain of air over the fire that has a mass flow and velocity that are in balance with the potential mass flow and velocity of the burning wood waste. If the curtain velocity is too high the FireBox or Trench can become over pressurized and over agitated. The higher pressure will lift the curtain and cause it to become ineffective. The over agitation will cause embers and ash to be blown out of the box or pit past the ineffective curtain at a significantly higher rate than normal. If the mass flow of the curtain is too low then the unburned particles (smoke) will penetrate the curtain on the high velocity of the hot gasses being generated from the burning wood.