

Comparison of forestry burning methods

	<i>Current open burning method</i>	<i>Standard incinerator method</i>	<i>Firebird V-III™ method</i>
How are limbs, branches, and chipped wood material disposed of?	Burned in open areas or in burn pits	Burned in a closed incinerator system	Burned in a closed combustion system
Does cut wood need to be seasoned?	Yes	Yes – standard incinerators cannot process very moist materials	No – the V-III™ can take up to a 20 to 25% moisture content
Are there any safety concerns?	Yes – winds can carry fly ash and sparks into forest areas causing fires	Fly ash and sparks can be reduced, but without expensive scrubber systems, there is still a chance for these emissions	With the vortex technology, fly ash or sparks are not created, therefore nothing will be emitted out into the atmosphere
Are there any harmful emissions?	Yes, recent studies have shown that forest fires and controlled burns produce toxic emissions	Yes, without complex and expensive exhaust scrubbers, standard incinerators will produce toxic emissions, even from burning of cut timber	No – the vortex technology doesn't allow for any emissions, not even smoke. The V-III™ doesn't require exhaust scrubbers
Can burning be done any time?	No – burning can take place only during the day, and only in certain times of the year	Yes – the closed system allows for burning to take place 24 hours a day, 365 days a year	Yes – the closed system allows for burning to take place 24 hours a day, 365 days a year
Can this handle “off-spec” pieces?	Yes – with an open burning, irregular forest residue can be burned at the same time.	Yes – incinerators can typically handle other materials, but depends on their method of insertion	Yes – the vortex technology works with standard woody material, as well as “off-spec”
What about ash residue?	Yes – open burning will produce significant ash residue, that would need to be disposed of separately	Yes – standard incineration only allows for incomplete combustion, therefore, ash residue will be a significant byproduct	No – the vortex technology is a complete and perfect combustion process, therefore, no ash residue is produced
Can energy be produced?	No – unless some additional system is added, there is no way to capture the heat for further processing	Yes – incinerators have been used in conjunction with energy recovery systems for decades	Yes – the V-III™ is an incredibly efficient combustion source as part of an energy recovery system
What about maintenance?	No maintenance is required since there is no equipment	Yes – standard incinerators require a great deal of down time for maintenance	No – with the vortex technology, there is virtually no maintenance necessary

What about fuel to operate?	The only fuel used in open burning is probably some type of accelerant	Standard incinerators would require a constant fuel source to maintain the high temperatures necessary.	The V-III™ requires only enough fuel to prime or start the operation. Once it reaches a superheated vortex stage, the priming fuel is shut off. The system is fully self-fueling, using the burning materials as its own fuel.
Other key points:			
1. Flexibility	N/A	Even mobile incinerators require some type of exhaust scrubber, and a regular source of fuel	The V-III™ does not require scrubber systems, and the source of priming fuel can be either natural gas or propane, allowing it to be used even in mobile situations
2. Efficiency	N/A	Although standard incineration has been used in applications for decades, it is less efficient due to the fact that it only achieves incomplete combustion. With the exhaust requiring scrubbers which reduce stack temperatures, the available output for energy recovery is diminished.	The V-III™ is a highly efficient system for several reasons. First, with no need for scrubbers or stack temperature reduction, the thermal output is many times more efficient than standard incineration. Second, with the material to be burned introduced tangentially into the chamber along with primary air, this system can process more material to burn. Third, with the material burning in suspension and becoming its own fuel source, the system can run 24 hours a day, with virtually no downtime for cleaning or maintenance.
3. Capacity	N/A	With typical grate incinerators, the capacity depends on the physical size of the unit. Since the material introduced is normally not shredded (or chipped), then it burns slower while it is resting on the grate.	The V-III™ uses a process of shredded materials blended with a primary air flow, introduced tangentially into the chamber. This allows more material to enter the free vortex along with the continuously burning particulate matter. This system (8' wide by 11' long) burning only one type of material, in this case wood, would allow for an increase above the typical 8 tons per hour to nearly 10 tons per hour, or 240 tons per 24 hour cycle.