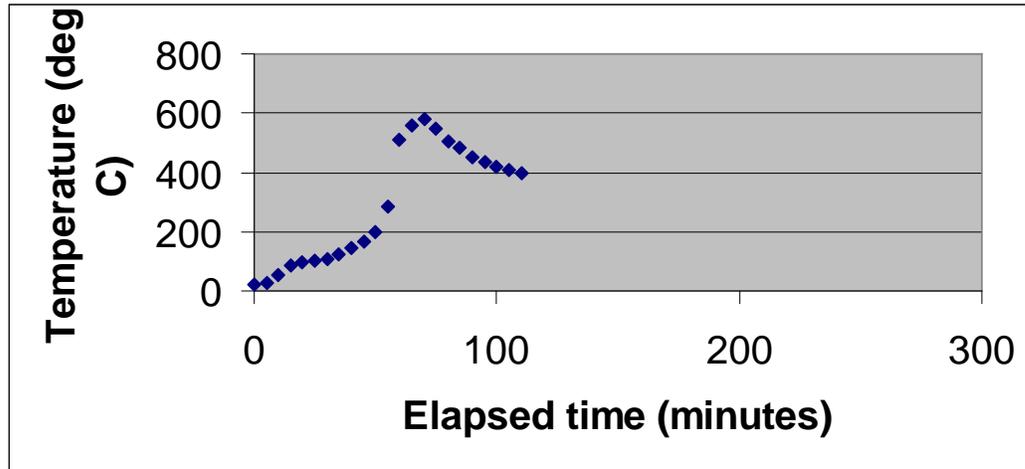


MAKING BIOCHAR

Type of Carboniser: Flow Force Technologies Model 250M.

Type of process: Slow pyrolysis.

Typical process temperature v. time:



SAMPLE OF TEST RESULTS

Test No.	Type of biomass	Biomass Weight (Kg)	Biochar Weight (Kg)	Gas Weight (Kg)	Avoided CO2 (net) (Kg)	Carbon Yield (%)
4	Hardwood pallets	23	12.7	4	20.5	38.6
9	Hardwood pallets	23	9.97	2.3	18.6	30
10	Green pine off-cuts	15	7.2	3.6	7.6	33.6
13	Green pine off-cuts	17	11	2.3	21	45
14	Green pine slats	18	9	2.3	16	35
15	Apple tree prunings	21	12	2.7	22.6	40
16	Apple tree prunings	16	8	2.7	12.4	35
18	Mixed native off-cuts	36	21	2.8	45	41
	TOTALS	169	91	22.7	164	37.7

Assumptions:

1. Carbon weight = Biochar weight x 0.7
2. Avoided CO2 gross weight = Carbon weight x 3.66
3. Specific CO2 emission of LPG = 3kgCO2/kg LPG
4. Avoided CO2 net weight = Avoided CO2 gross weight – (3 x Gas weight used)
5. Carbon yield = Carbon weight/Biomass weight x 100%

MAKING BIOCHAR

Notes:

1. Excluded tests were inconclusive because of experimental error, lost data or not completed.
2. Tests were attempted with wood chips and mulch but were aborted because of excessive use of start-up gas. Such material tends to be moist and densely packed so does not carbonize efficiently when using this particular design of Carboniser.
3. Biomass moisture content was not measured. Probable moisture contents were: hardwood pallets: 10%; pine off-cuts: 30%; apple tree: 10%; mixed native: 10%

CONCLUSIONS:

1. This design of Carboniser works best with lumpy material that allows good heat transfer throughout the drum.
2. Average carbon yield was 38% of biomass weight.
3. Typically the net weight of avoided CO₂ approximates the weight of biomass.
4. The period of time at which the biochar is allowed to soak at high temperature can be controlled to some extent by adjustment of air inlet dampers and the time of dumping. In most cases for convenience we dumped the biochar and dowsed it with water as soon as the temperature had dropped to below 400C.
5. In every case the quality of biochar (eg texture, hardness, porosity, colour etc) appeared very good. Samples have been retained so that carbon content, ash content and volatiles content can be determined by laboratory analysis.

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FOOTNOTE: All the biochar we have produced has been used by gardeners in their compost or added directly to the soil. We hope to report on their findings at some future date.