Fig. S1. Outer appearance of the carbonization test facility. The carbonizer (an externally heated rotary kiln) had a diameter of 800 mm (inner cylinder), a length of 6 m, and an effective heating length of 5 m, and it was able to process raw material chips at rates of up to 200 kg/h, although the upper feed rate was dependent on the shape and moisture content of the raw material. The rotation speed of the inner cylinder of the kiln could be controlled to within 1.2–5.5 rpm. The carbonization temperature could be set within a range of 200–650°C by controlling the temperature at the outlet of the blast furnace fueled with liquefied petroleum gas.

Table S1. Color differences of raw and carbonized WB samples.

Sample	No.	L^* [–]	a^* [–]	b^* [–]	h_{ab} [°]
Untreated rubber tree	R-1	47.7	11.1	17.0	56.8
Carbonized rubber tree	R-2	37.5	12.6	15.5	50.8
	R-3	46.3	12.6	18.4	55.5
	R-4	28.9	10.3	9.5	42.7
	R-5	43.2	11.2	16.2	55.2
	R-6	21.5	5.1	1.2	12.8
	R-7	26.0	7.8	5.5	35.5
	R-8	20.7	4.5	0.4	4.7
	R-9	21.1	4.3	0.3	3.5
	R-10	19.9	4.0	–0.4	–5.8
	R-11	19.5	3.6	–0.8	–13.1
	R-12	19.2	3.4	–1.1	–17.7
	R-13	20.3	3.0	–1.1	–21.1
	R-14	20.2	3.2	–0.9	–16.0
	R-15	19.6	3.4	–0.9	–14.6
Untreated softwood bark	B-1	33.6	14.9	14.6	44.5
Carbonized softwood bark	B-2	30.0	10.7	9.6	42.0
	B-3	25.2	8.2	5.3	33.1
	B-4	24.6	7.6	4.8	32.4
	B-5	27.0	9.3	7.4	38.3
	B-6	25.9	7.6	5.4	35.6
	B-7	24.8	6.6	3.8	30.1
	B-8	23.7	6.9	3.8	29.2
	B-9	22.0	5.0	1.4	15.7
	B-10	23.6	6.6	3.5	27.7
	B-11	25.0	7.5	4.9	33.3
	B-12	22.5	5.8	2.4	22.6
	B-13	23.9	6.6	3.7	29.1
	B-14	20.9	4.0	–0.1	–0.7
	B-15	21.1	4.8	0.8	9.7
Untreated lumber waste	W-1	57.2	9.1	18.4	63.7
	W-2	33.7	12.9	15.1	49.5
	W-3	40.9	14.2	20.8	55.7
	W-4	27.3	10.0	8.7	40.9
	W-5	27.2	9.6	8.1	40.1
	W-6	21.3	4.1	0.2	2.4
	W-7	21.9	5.8	2.0	19.4
	W-8	21.3	4.2	0.7	9.3
Carbonized lumber waste	W-9	23.9	7.0	3.6	27.3
	W-10	23.6	6.0	2.9	25.7
	W-11	22.1	4.7	1.2	14.2
	W-12	21.6	4.0	0.3	0.5
	W-13	21.7	3.4	–0.2	–3.8
	W-14	21.5	4.1	0.5	7.0
	W-15	20.9	3.5	–0.6	–10.5

Color measurements were performed after pulverizing the carbonized WB to a 200-mesh size. Sample colors were defined in the $L^*a^*b^*$ color space.