

Internal Project Information Note 02/08 - Extended summary  
**Small scale chippers – standards review**

Woodchips produced from ten small scale chippers were assessed for particle size variability against the CEN/TS 335 biofuel specification.

Birch (*Betula pendula*) and Corsican pine (*Pinus nigra var maritima*) roundwood was used for the trial. The specification of the feedstock to be processed by nine of the ten chippers was:

- Birch – 2.9m x 11.0 cm average mid diameter
- Pine – 1.7 m x 10 cm average mid diameter

The specification used to test the TP 100 VM was slightly smaller to reflect the chipper’s maximum diameter. As a result the specification used with this machine was:

- Birch – 1.7m x 7.5 cm average mid diameter
- Pine – 1.7 m x 7.5 cm average mid diameter

The average moisture content of the chips produced (on a wet basis) was 44.41% for the Birch and 59.16% for the Pine.

All 10 chippers were set up to produce woodchips to conform to the P16 specification as described by CEN/TC 335 standard, as shown below:

CEN TC/335 specification	Coarse Fraction Maximum length of particle	Main Fraction > 80% weight	Fine Fraction < 5% weight
<b>P16</b>	<1% >45 mm, maximum length of particle < 85 mm	3.15 mm ≤P ≤16 mm	<1 mm
<b>P45</b>	<1% > 63 mm	3.15 mm ≤P ≤45 mm	<1 mm
<b>P63</b>	<1% > 100 mm	3.15 mm ≤P ≤63 mm	<1 mm



Sampling was carried out in accordance with the technical specification CEN /TS 14778 – 1: 2005 Solid Biofuels sampling. The sampled material was sent to an accredited sampling laboratory for particle size analysis. The standard specifications met by chips produced by the various chippers are shown in the table below:

Chipper	Species	P45	P16
Heizohack HM 5 –400	Pine and Birch	✓	✓
Laimet HP 21	Pine and Birch	✓	✗
Schliesing 550 ZX	Pine and Birch	✓	✗
Farmi CH260	Pine and Birch	✓	✓
TP 100 VM	Pine and Birch	✓	✗
TP 150	Pine	✓	✓
	Birch	✓	✗
TP 200	Pine and Birch	✓	✓
Jensen A 240	Pine and Birch	✓	✗
Greenmech 19-28	Pine and Birch	✓	✗
Greenmech M220MT	Pine and Birch	✓	✗

Some of the chippers used in the trial had not been designed specifically to produce woodchips for heating however all were capable of producing woodchips from Birch and Corsican Pine roundwood conforming to the P45 specification.

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#### **Other related work**

The work summarised here is part of an ongoing programme of research funded by the Forestry Commission aimed at improving the efficiency with which fuel is harvested from sustainably managed forests in the UK. It follows on from an assessment of the operational safety, efficiency, productivity and noise levels from the same ten small scale chippers (IPIN 06/05, Chippers review, 2005). An assessment of large scale chippers was also carried out in 2006 (IPIN19/06, Large chippers).