European standards for solid biofuels

Fuel specification and classes, multipart standard
Case – wood pellets & chips
November 2009

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CEN/TC 335 standards for solid biofuels

- **Bridging Properties** (under preparation)
- **Net calorific value** prEN 14918
- **Ash content** prEN 14775
- **Moisture content** prEN 14774
- **Impurities** (postponed)
- **Particle size distribution** prEN 15149
- **Bulk density** prEN 15130
- **Particle density** prEN 15150
- **Mechanical durability** (pellets & briquettes) prEN 15210
- **Ash melting behaviour** prEN 15370

**Fuel specification and classes** prEN 14961 (multipart)
**Fuel quality assurance** prEN 15234 (multipart)
**Terminology** prEN 14588
**Sampling and sample preparation** prEN 14778, 14780
Specification and classes (prEN 14961-1)

- Classification is based on origin and source, major traded forms and properties.

- Hierarchical classification system in table format:
  1. Woody biomass
  2. Herbaceous biomass
  3. Fruit biomass
  4. Biomass blends and mixtures
     - blends = intentional
     - mixtures = unintentional

- Part 1 for all user groups, Parts 2–6 for non-industrial use.

- Special requirements for chemically treated biomass.

- Chemical treatment defined as any treatment with chemicals other than air, heat or water (e.g. glue and paint).
Solid biofuel utilisation chain

Origin/Source
- Biomass
- Documentation of origin (Table 1 in EN14961-1)

Traded form (e.g. pellet)
- Fuel production

Solid biofuel
- Conversion

Bioenergy use
- Product declaration (prEN 15234)
- Fuel Quality Assurance (prEN 15234 upgrading ongoing)

Tables with property grades in prEN 14961-1
1.2 Wood processing industry by-products and residues (Table 1, EN 14961-1)

| 1.2.1 Chemically untreated wood residues | 1.2.1.1 Without bark, Broadleaf |
|                                         | 1.2.1.2 Without bark, Coniferous |
|                                         | 1.2.1.3 With bark, Broadleaf     |
|                                         | 1.2.1.4 With bark, Coniferous    |
|                                         | 1.2.1.5 Bark (from industry operations) a |
| 1.2.2 Chemically treated wood residues, fibres and wood constituents | 1.2.2.1 Without bark |
|                                         | 1.2.2.2 With bark                |
|                                         | 1.2.2.3 Bark (from industry operations) a |
|                                         | 1.2.2.4 Fibres and wood constituents |
| 1.2.3 Blends and mixtures               |                                |

- Cork is under bark
- Chemically treated wood may not include heavy metals or halogenated compounds as a result of treatment with wood preservatives or coating
Examples of classification for typical pellet raw material

▼ Cutter chips, sawdust, grinding dust
  • class 1.2.1.1 (birch) or class 1.2.1.2 (spruce, pine)

▼ Cutter shaving from furniture industry (some glue included)
  • chemically treated woody biomass
  • class 1.2.2.1 or 1.2.2.1

▼ Blend of bark and cutter shavings
  • class 1.2.1.7

▼ Blend of chemically untreated and treated wood biomass
  • classified as chemically treated wood biomass, class 1.2.2.1 or 1.2.2.2

▼ Straw
  • 2.1.2.2 Straw
Flexible classification – Part 1

- Classification is flexible, and hence the producer or the consumer may select from each property class

- This classification does not bind different characteristics with each other

- The fuel supply chain shall be unambiguously traceable back over the whole chain

- For these traded forms, a table including property classes
  - Example **M10**, means that moisture content has to be less than \( \leq 10\% \) on average
Some of the properties are **normative** (mandatory)
- origin and source always to be stated
- normative properties vary depending on both origin and traded form
- moisture content (M), and ash content (A) for all fuels

Some properties are **informative** (voluntary), but they are recommended to be stated
Major traded forms – prEN14961-1

- Briquettes (Table 3)
- Pellets (Table 4)
- Wood chips (Table 5)
- Hog fuel (Table 6)
- Wood logs (Table 7)
- Sawdust (Table 8)
- Shavings (Table 9)
- Bark (Table 10)
- Straw bales, reed canary grass bales and Miscanthus bales (Table 11)
- Energy grain (Table 12)
- Olive residues (Table 13)
- Fruit seed (Table 14)
- General master table for others (Table 15)
Densified biofuel

- made from pulverised biomass
- with or without pressing aids
- usually with a cylindrical form,
- random length and typically 5 to 40 mm, with broken ends

The raw material for biofuel pellets can be

- woody biomass,
- herbaceous biomass,
- fruit biomass, or
- biomass blends and mixtures
- Pellets are usually manufactured in a die
- The total moisture is usually less than 10% of their mass
Pellets – Normative properties (Part 1)

Origin (Table 1 - Part 1)

- Woody biomass 1
- Herbaceous biomass 2
- Fruit biomass 3
- Blends and mixtures 4

Dimensions

<table>
<thead>
<tr>
<th>Class</th>
<th>Diameter (D)</th>
<th>Length (L)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D06</td>
<td>≤ 6 ± 1,0 mm</td>
<td>3,15 ≤ L ≤ 40 mm (95 w-%)</td>
</tr>
<tr>
<td>D08</td>
<td>≤ 8 ± 1,0 mm</td>
<td>3,15 ≤ L ≤ 40 mm (95 w-%)</td>
</tr>
<tr>
<td>D10</td>
<td>≤ 10 ± 1,0 mm</td>
<td>3,15 ≤ L ≤ 40 mm (95 w-%)</td>
</tr>
<tr>
<td>D12</td>
<td>≤ 12 ± 1,0 mm</td>
<td>3,15 ≤ L ≤ 50 mm (95 w-%)</td>
</tr>
<tr>
<td>D25</td>
<td>≤ 25 ± 1,0 mm</td>
<td>10 ≤ L ≤ 50 mm (95 w-%)</td>
</tr>
</tbody>
</table>

Maximum length of pellets: 45 mm in classes D06, D08 and D10
Pellets – Normative (Part 1)

**Moisture (M)**
- M10 ≤ 10 % as received
- M15 ≤ 15 % as received

**Ash content (A)**
- A0.5 ≤ 0.5 % dry basis
- A0.7 ≤ 0.7 % dry basis
- A1.0 ≤ 1.0 % dry basis
- A1.5 ≤ 1.5 % dry basis
- A3.0 ≤ 3.0 % dry basis
- A5.0 ≤ 5.0 % dry basis
- A7.0 ≤ 7.0 % dry basis
- A10.0 ≤ 10.0 % dry basis
- A10.0+ > 10.0 % dry basis, minimum value to be stated

**Bulk density (BD) (kg/m³)**
- To be stated in the following classes BD550, BD600, BD650, BD700 and BD700+ (minimum value to be stated)

Drying oven, moisture content
prEN 14774-1 – 3

High temperature laboratory furnace
Ash content prEN 14775
Pellet - Normative (Part 1)

**Amount of fines (F)**
When loaded or packaged
Fines < 3,15 mm
- F1.0  ≤ 1,0 w-%
- F2.0  ≤ 2,0 w-%
- F3.0  ≤ 3,0 w-%
- F5.0  ≤ 5,0 w-%
- F5.0+ > 5,0 w-%, maximum value to be stated

**Additives**
- Type of pressing aids, slagging inhibitors or any other additives to be stated
- The amount of additives should not be more than 20 w-% of pressing mass. If the amount of additive is more than 20 w-% of the pressing mass then these are blended pellets

3,15 mm sieve according to ISO 3310
Particle size distribution prEN 15149
Net calorific value as received (Q)

- Minimum value to be stated (calculation by taking into account the selected moisture category and the typical variation of the net calorific value of dry matter at constant pressure)

\[ q_{p,\text{net,ar}} = q_{p,\text{net,d}} \times \left( \frac{100 - M_{\text{ar}}}{100} \right) - 0.02443 \times M_{\text{ar}} \]

- \( q_{p,\text{net,ar}} \) net calorific value as received, (MJ/kg)
- \( q_{p,\text{net,d}} \) net calorific value (constant pressure) dry basis (MJ/kg)
- \( M_{\text{ar}} \) total moisture (w-%)
- 0.02443 is the correction factor of the enthalpy of vaporization (constant pressure) for water (moisture) at 25 °C [MJ/kg per 1 w-% of moisture]

Calculation formula is available in EN 14961-1
Mechanical durability (DU)

- DU97.5 ≥ 97.5 % pellets after testing
- DU96.5 ≥ 96.5 % pellets after testing
- DU95.0 ≥ 95.0 % pellets after testing
- DU95.0- < 95.0 % pellets after testing, minimum value to be stated

Test portion 500 ± 10 g
50 ± 2 rpm for 500 rotations

Testing apparatus for mechanical durability according prEN 15210-1
Sulphur (S)

- Sulphur is normative only for chemically treated biomass (1.2.2, 1.3.2, 2.2.2, 3.2.2) or if sulphur containing additives have been used
  - $S_{0.02} \leq 0.02 \text{ w-% dry basis}$
  - $S_{0.05} \leq 0.05 \text{ w-% dry basis}$
  - $S_{0.08} \leq 0.08 \text{ w-% dry basis}$
  - $S_{0.10} \leq 0.10 \text{ w-% dry basis}$
  - $S_{0.20} \leq 0.20 \text{ w-% dry basis}$
  - $S_{0.20+} > 0.20 \text{ w-% dry basis}$, and maximum value to be stated

Analyzer for S, C
According to method prEN 15289

02/12/2009
Nitrogen (N)

- Nitrogen is normative only for chemically treated biomass (1.2.2, 1.3.2, 2.2.2, 3.2.2)

- $N_{0.3} \leq 0.3 \text{ w-\% dry basis}$
- $N_{0.5} \leq 0.5 \text{ w-\% dry basis}$
- $N_{1.0} \leq 1.0 \text{ w-\% dry basis}$
- $N_{2.0} \leq 2.0 \text{ w-\% dry basis}$
- $N_{3.0} \leq 3.0 \text{ w-\% dry basis}$
- $N_{3.0+} > 3.0 \% \text{ w-\% dry basis and maximum value to be stated}$

CHN-analyzer
According to method prEN 15104
**Chlorine (Cl)**

- Chlorine is normative only for chemically treated biomass (1.2.2, 1.3.2, 2.2.2, 3.2.2)

- Cl 0.02 \( \leq \) 0.02 w-% dry basis
- Cl 0.03 \( \leq \) 0.03 w-% dry basis
- Cl 0.07 \( \leq \) 0.07 w-% dry basis
- Cl 0.10 \( \leq \) 0.10 w-% dry basis
- Cl 0.10+> 0.10 w-% dry basis

The maximum value to be stated

Analysis according to method prEN 15289 (total S, Cl)

Photos: ofi & ENAS Oy
Wood pellets
(EN 14961-1)

Amount of fines (< 3,15mm) ≤ 1 w-%

Pellet length, 3,15– 40 mm ≥ 95 w-%

Maximum length, 45 mm < 5 w-%
Product standards – Parts 2, 3, 4, 5 & 6

- Separate product standards for
  - Part 2 - wood pellets for non-industrial use
  - Part 3 - wood briquettes for non-industrial use
  - Part 4 - wood chips for non-industrial use
  - Part 5 – firewood for non-industrial use
  - Part 6 – non-woody pellets for non-industrial use

- Targeted for non-industrial use in small-scale appliances, such as, in households and small commercial and public sector buildings.

- In product standards properties are bound together to form a class and all properties are normative
**Product standard - Non-industrial wood pellets (Part 2)**  
**Properties agreed in November 2009 (draft)**

<table>
<thead>
<tr>
<th>Property</th>
<th>A1</th>
<th>A2</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origin</td>
<td>1.1 and 1.2.1</td>
<td>1.1 and 1.2.1</td>
<td>1.1, 1.2, 1.3</td>
</tr>
<tr>
<td>Dimensions</td>
<td>D06, D08 (+ 1 mm)</td>
<td>D06, D08 (+ 1 mm)</td>
<td>D06, D08 (+ 1 mm)</td>
</tr>
<tr>
<td></td>
<td>3.15 ≤ L ≤ 40 mm</td>
<td>3.15 ≤ L ≤ 40 mm</td>
<td>3.15 ≤ L ≤ 40 mm</td>
</tr>
<tr>
<td></td>
<td>Max. 45 mm (1 w-%)</td>
<td>Max. 45 mm (1 w-%)</td>
<td>Max. 45 mm (1 w-%)</td>
</tr>
<tr>
<td>Moisture, M</td>
<td>≤ 10 w-%</td>
<td>≤ 10 w-%</td>
<td>≤ 10 w-%</td>
</tr>
<tr>
<td>Ash content, A dry basis</td>
<td>0.7 w-%</td>
<td>1.5 w-%</td>
<td>3.0 w-%</td>
</tr>
<tr>
<td>Bulk density, BD</td>
<td>≥ 600 kg/m³</td>
<td>≥ 600 kg/m³</td>
<td>≥ 600 kg/m³</td>
</tr>
<tr>
<td>Mechanical durability, DU</td>
<td>≥ 97.5 w-%</td>
<td>≥ 97.5 w-%</td>
<td>≥ 96.5 w-%</td>
</tr>
<tr>
<td>Net calorific value as received, Q</td>
<td>≥ 16.5 MJ/kg [4.6 kWh/kg]</td>
<td>≥ 16.5 MJ/kg [4.6 kWh/kg]</td>
<td>≥ 16.0 MJ/kg [4.4 kWh/kg]</td>
</tr>
<tr>
<td>Fines, F (&lt; 3.15 mm)</td>
<td>The amount of fines shall be ≤ 1% leaving the final point of loading for delivery to the end-user. i.e leaving the final storage point or the factory if delivering directly to the end-user. The amount of fines leaving the factory gate shall also be ≤ 1% (unless there is a different agreement between the producer and their customer).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Additives ≤ 2 w-% of pressing mass dry basis, type (e.g. starch, corn flour, vegetable oil) and amount to be stated.

02/12/2009
Product standard – Non-industrial wood pellets and briquettes (Part 2, 3) – Properties agreed in Nov 2009

<table>
<thead>
<tr>
<th>Property</th>
<th>A1</th>
<th>A2</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulphur, S dry basis</td>
<td>S0.05</td>
<td>S0.05</td>
<td>S0.05</td>
</tr>
<tr>
<td>Nitrogen, N dry basis</td>
<td>NO.3</td>
<td>NO.5</td>
<td>N1.0</td>
</tr>
<tr>
<td>Chlorine, Cl, dry basis</td>
<td>Cl0.02</td>
<td>Cl0.03</td>
<td>Cl0.03</td>
</tr>
<tr>
<td>Ash melting behaviour, DT °C*</td>
<td>≥ 1 200</td>
<td>≥ 1 100</td>
<td>≥ 1 100</td>
</tr>
<tr>
<td>Arsenic, As mg/kg dry</td>
<td>≤ 1</td>
<td>≤ 1</td>
<td>≤ 1</td>
</tr>
<tr>
<td>Cadmium, Cd, mg/kg dry**</td>
<td>≤ 0.5</td>
<td>≤ 0.5</td>
<td>≤ 0.5</td>
</tr>
<tr>
<td>Chromium, Cr mg/kg dry**</td>
<td>≤ 10</td>
<td>≤ 10</td>
<td>≤ 10</td>
</tr>
<tr>
<td>Copper, Cu, mg/kg dry**</td>
<td>≤ 10</td>
<td>≤ 10</td>
<td>≤ 10</td>
</tr>
<tr>
<td>Lead, Pb, mg/kg dry**</td>
<td>≤ 10</td>
<td>≤ 10</td>
<td>≤ 10</td>
</tr>
<tr>
<td>Mercury, Hg, mg/kg dry**</td>
<td>≤ 0.05</td>
<td>≤ 0.05</td>
<td>≤ 0.05</td>
</tr>
<tr>
<td>Nickel, Ni, mg/kg dry**</td>
<td>≤ 10</td>
<td>≤ 10</td>
<td>≤ 10</td>
</tr>
<tr>
<td>Zinc, Zn, mg/kg dry**</td>
<td>≤ 100</td>
<td>≤ 100</td>
<td>≤ 100</td>
</tr>
</tbody>
</table>

* Not for briquettes, DT = deformation temperature (Analysis EN15370-1)

** 1 000 mg/kg = 1 000 ppm = 0.1%, Analysis prEN 15297 – Minor elements values with red colour not yet agreed, to be agreed in March 2010

02/12/2009
Wood chips and hog fuel – prEN14588

Wood chips - 4.183
- chipped woody biomass in the form of pieces with a defined particle size produced by mechanical treatment with sharp tools such as knives
  - wood chips have a sub-rectangular shape with a typical length 5 to 50 mm and a low thickness compared to other dimensions.
  - cutter chips, forest chips, green chips, stemwood chips, and whole-tree chips.

Hog fuel - 4.94
- fuelwood in the form of pieces of varying size and shape, produced by crushing with blunt tools such as rollers, hammers, or flails
### Wood chips – EN 14961-1

<table>
<thead>
<tr>
<th>Class</th>
<th>Minimum 75-w% in main fraction, mm&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Fines fraction, w-% (&lt;3,15 mm)</th>
<th>Coarse fraction, w-%</th>
</tr>
</thead>
<tbody>
<tr>
<td>P16A</td>
<td>3,15&lt; P ≤ 16 mm</td>
<td>≤ 12 %</td>
<td>≤3% &gt;16 mm and all 30 mm&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>P16 B</td>
<td>3,15&lt; P ≤ 16 mm</td>
<td>≤ 12 %</td>
<td>≤3% &gt;45 mm and all 120mm&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>P45A</td>
<td>8 &lt; P ≤ 45 mm</td>
<td>≤ 8 %&lt;sup&gt;b&lt;/sup&gt;</td>
<td>≤ 6% &gt;63 mm, and max. 3,5% &gt; 100 mm, all &lt;120 mm, ≤ 6% &gt; 63 mm, and max. 3,5% &gt; 100 mm all &lt;350 mm</td>
</tr>
<tr>
<td>P45B</td>
<td>8 &lt; P ≤ 45 mm</td>
<td>≤ 8 %&lt;sup&gt;b&lt;/sup&gt;</td>
<td>≤ 6% &gt; 100 mm, and all &lt; 350 mm</td>
</tr>
<tr>
<td>P63</td>
<td>8 &lt; P ≤ 63 mm</td>
<td>≤ 6 %&lt;sup&gt;b&lt;/sup&gt;</td>
<td>≤ 6% &gt; 200 mm, and all &lt; 350 mm</td>
</tr>
<tr>
<td>P100</td>
<td>16 ≤ P ≤ 100 mm</td>
<td>≤ 4 %&lt;sup&gt;b&lt;/sup&gt;</td>
<td>≤ 6% &gt; 200 mm, and all &lt; 350 mm</td>
</tr>
</tbody>
</table>

<sup>a</sup> The numerical values (P-class) for dimension refer to the particle sizes passing through the mentioned round hole sieve size according to standards prEN 15149-1.

<sup>b</sup> Main fraction for P45B is 3,15< P ≤ 45 mm, for P63 is 3,15< P ≤ 63 mm and for P100 is 3,15< P ≤ 100 mm and amount of fines can be maximum 25 w-%, if raw material is logging residue, which includes thin particles like branches, needles or leaves.

<sup>c</sup> The cross sectional area of the oversized particles shall be P16<1 cm², for P45< 5 cm², for P63< 10 cm² and P100 < 10 cm².
The numerical values (P-class) for dimension refer to the particle sizes passing through the mentioned round hole sieve size according to standards prEN 15149-1.

The cross sectional area of the oversized particles shall be P16<1 cm².
The numerical values (P-class) for dimension refer to the particle sizes passing through the mentioned round hole sieve size according to standards prEN 15149-1.

Main fraction for P45B is $3.15 \leq P \leq 45$ mm, and amount of fines can be maximum 25 w-%, if raw material is logging residue, which includes thin particles like branches, needles or leaves.

The cross sectional area of the oversized particles shall be for $P45 < 5$ cm²
Particle size P63 and P100

The numerical values (P-class) for dimension refer to the particle sizes passing through the mentioned round hole sieve size according to standards prEN 15149-1.

Main fraction for P63 is $3,15 < P \leq 63$ mm and for P100 is $3,15 < P \leq 100$ mm and amount of fines can be maximum 25 w-%, if raw material is logging residue, which includes thin particles like branches, needles or leaves.

02/12/2009

The cross sectional area of the oversized particles shall be for P63 < 10 cm$^2$ and P100 < 10 cm$^2$. 
Wood chips – normative (EN 14961-1)

- **Moisture, M** from M10 to M55 (5 %-unit intervals), M55+ (maximum value to be stated)
- **Ash, A** classes A0.5, A0.7, A1.0, A1.5, A3.0, A5.0, A6.0 and A6.0+ (maximum value to be stated)

Wood chips – normative or informative (EN 14961-1)

- **Nitrogen, N**, N0.3, N0.5, N1.0, N2.0, N3.0, N3.0+ (maximum value to be stated)
- **Chlorine, Cl**, Cl0.02, Cl0.03, Cl0.07, Cl0.1, Cl0.1+ (maximum value to be stated)
- Nitrogen and chlorine are normative only for classes (1.2.2; 1.3.2), chemically treated wood
Wood chips – informative (voluntary)-EN14961-1

- **Net calorific value** $Q$ (MJ/kg as received) or **energy density**, $E$ (kWh/loose-m$^3$),
  - minimum value to be stated
  - Can be calculated by moisture and net calorific value of dry basis, which can be taken from literature or measured.

- **Ash melting behaviour**
  - Deformation temperature (DT, °C) to be stated
Wood chips – informative (voluntary)-EN14961-1

- **Bulk density, BD** (kg/m³)
  Classes BD150; BD200; BD250; BD300; BD350; BD400 and BD450+ (maximum value to be stated)
  – Recommended to be stated, if traded by volume basis.
How to use classification

- Boiler/burner manufacturer can select the property classes for the product
- Classification can be marked on the product

For packages information has to be marked on the packages
For bulk material: Product Declaration to be used

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Ariterm Oy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output</td>
<td>200 kW</td>
</tr>
<tr>
<td></td>
<td>EN303-5</td>
</tr>
<tr>
<td>Fuel</td>
<td>Wood chips</td>
</tr>
<tr>
<td></td>
<td>EN 14961-4 (A2)</td>
</tr>
</tbody>
</table>
### Example of product declaration according to Part 1 – Bulk delivery – industrial pellets

<table>
<thead>
<tr>
<th></th>
<th>EN 14961 – 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Producer</strong></td>
<td>EAA Biofuels</td>
</tr>
<tr>
<td><strong>Pellet factory</strong></td>
<td>Jyväskylä, Finland</td>
</tr>
<tr>
<td><strong>Origin</strong></td>
<td>1.2.1.2 (Sawdust, pine)</td>
</tr>
<tr>
<td><strong>Traded form</strong></td>
<td>Pellets</td>
</tr>
<tr>
<td><strong>Normative</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Dimensions</strong></td>
<td>D08</td>
</tr>
<tr>
<td><strong>Moisture, w-%</strong></td>
<td>M 10</td>
</tr>
<tr>
<td><strong>Ash, w-% dry</strong></td>
<td>A0.7</td>
</tr>
<tr>
<td><strong>Mechanical durability, w-% pellets after testing</strong></td>
<td>DU97.5</td>
</tr>
<tr>
<td><strong>Amount of fines, w-% (&lt; 3,15 mm)</strong></td>
<td>F1.0</td>
</tr>
<tr>
<td><strong>Additives, w-% of pressing mass</strong></td>
<td>0.5 w-% starch</td>
</tr>
<tr>
<td><strong>Bulk density, kg/m³</strong></td>
<td>BD 650</td>
</tr>
<tr>
<td><strong>Net calorific value as received, kWh/kg</strong></td>
<td>Q4.7</td>
</tr>
<tr>
<td><strong>Informative</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Sulphur, w-% dry basis</strong></td>
<td>0.05</td>
</tr>
<tr>
<td><strong>Nitrogen, w-% dry basis</strong></td>
<td>N0.3</td>
</tr>
<tr>
<td><strong>Chlorine, w-% dry basis</strong></td>
<td>CI0.03</td>
</tr>
</tbody>
</table>
Example of product declaration for wood chips

<table>
<thead>
<tr>
<th>EN 14961 – 1</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Producer</strong></td>
</tr>
<tr>
<td><strong>Location</strong></td>
</tr>
<tr>
<td><strong>Origin</strong></td>
</tr>
<tr>
<td><strong>Traded form</strong></td>
</tr>
<tr>
<td><strong>Normative</strong></td>
</tr>
<tr>
<td>Dimensions</td>
</tr>
<tr>
<td>Moisture, w-%</td>
</tr>
<tr>
<td>Ash, w-% dry</td>
</tr>
<tr>
<td><strong>Informative</strong></td>
</tr>
<tr>
<td>Bulk density, kg/m³</td>
</tr>
<tr>
<td>Net calorific value as received, MJ/kg</td>
</tr>
<tr>
<td>Sulphur, w-% dry basis</td>
</tr>
<tr>
<td>Nitrogen, w-% dry basis</td>
</tr>
<tr>
<td>Chlorine, w-% dry basis</td>
</tr>
</tbody>
</table>
Example of product declaration of wood pellets – package

**Producer**
EAA Biofuels  
P.O. Box 1603, FI-40101 Jyväskylä  
Tel. +358 20722 2550

**Origin:**
1.2.1.2 Coniferous wood without bark

**Traded Form:**
Pellets – Class A1

**Country of origin**
Jyväskylä, Finland

**Normative (EN 14961-2)**

| **Dimensions** | **D08 (D= 8±1 mm, and 3,15 ≤ L ≤ 40 (95%)**<br>Maximum 45 mm | **M10 ( ≤ 10 %)**<br>A0.7 < 0.7% | **DU97.5 < 97,5%**<br>F1.0 < 1% | **Q ≥ 4,7 kWh/kg**<br>Starch < 1 w-%<br>**Bulk density as received (kg/m³)** | **DB600 ≥ 600 kg/m³**<br>N0,3, S0,05, Cl0,02<br>Ash melting behaviour, (DT °C) | **≥ 1 200**<br>**Minor elements (mg/kg dry basis)** | As 1, Cd 0.5, Cr 10, Cu 10, Pb 10, Hg 0.05, Ni 10, Zn 100 |
| Diameter (D), length (L) | **Moisture**<br>(w-% as received) | **Ash**<br>(w-% of dry basis) | **Mechanical durability**<br>(w-% of pellets after testing) | **Amount of fines**<br>(w-%, < 3.15 mm) | **Net calorific value, Q**<br>Additives | **Chemical composition (w-% dry basis)** | **Ash melting behaviour, (DT °C)** | **Minor elements (mg/kg dry basis)** |
More information: Eija Alakangas, VTT, convenor WG2/CEN/TC 335
eija.alakangas@vtt.fi, Tel.+358 20 722 2550

02/12/2009