DIN CERTCO
Gesellschaft für Konformitätsbewertung mbH

Certification Scheme

Wood pellets for use in small furnaces

in accordance with

DIN 51731 – HP 5
(ÖNORM M 7135 – HP1)

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CONTENT

1 Inspection basis

DIN 51731 "Pellets produced from untreated wood - HP 5"
(ÖNORM M 7135 "Pellets produced from untreated wood or untreated bark, pellets and briquettes – HP1")

2 Additional requirements

2.1 Combustion requirements

Table 1

Properties	Unit	Requirements	Inspection in accordance with
Diameter	Mm	$4 \leq d < 10$ [1])	Section 3.2
Length	Mm	$\leq 5 \times d$ [2])	
Apparent density	kg/dm^3	$\geq 1{,}12$ [3])	Section 3.3
Water content	%	≤ 10,0	Section 3.5
Ash content [4])	%	≤ 0,50 [5])	Section 3.6
Net calorific value [4])	MJ/kg	≥ 18,0	Section 3.7
Sulphur content [4])	%	≤ 0,04	Section 3.8
Nitrogen content [4])	%	≤ 0,30	Section 3.9
Chlorine content [4])	%	≤ 0,02	Section 3.10
Abrasion	%	2,3 [6])	Section 3.11
Auxiliary pressing material [7] [8]	%	2,0	

1) The diameter to be indicated in accordance with section "Identifying marking" must lie within a tolerance of ± 10 % of the indicated diameter.
2) A maximum of 20% of the majority of the pellets may have a length of up to 7.5 x d.
3) Refer to section 3.1
4) In anhydrous condition (wf)
5) The ash content may be up to 0.80 %, if the untreated wood used already has naturally higher ash content.
6) Sampling corresponding to section 3.1
7) Chemically unmodified products from primary agricultural and forestry biomass (for example wholemeal corn, cornstarch and rye flour) may be mixed with the raw materials for the production of wood or bark pellets to ease the pressing procedure and also, as a result, an improvement of the energy balance and to increase the abrasion resistance.
8) The inspection regarding the method and quantity of auxiliary pressing material is made within the framework of third-party surveillance, supported by manufacturer documentation, in accordance with section 5.1.

2.2 Contaminants, foreign substances

Pellets may only be produced from untreated wood or untreated bark also with the addition of auxiliary pressing material in accordance with 3.3.

For example, the following foreign substances are prohibited:
- Wood containing biocide or trunk protective agent;
- Adhesives and/or plastics;
- Varnish and other coating materials.

2.3 Fine particle share

Pellet grindings created during manufacture must be separated before leaving the production department. The segregation can be delayed if it can be proven that this fine particle share is removed at another part of the conveyor chain.

3 Additional tests

3.1 Sampling

When taking samples a distinction between two types is to be made.

3.1.1 Extraction from flowing goods

The necessary specimen material is to be taken from the “flow of goods” in the form of a minimum of 5 spot samples, each with a mass of 0.5 kg. The sampling has to be made at the latest possible extraction point at the production plant.

The specimen materials are to be taken so that between extractions, staggered within a given time, a multiple (at least ten times) of the quantity of a single specimen probe pass on the conveyor route.

3.1.2 Extraction from stock piled goods

The necessary specimen material, a minimum of 5 spot samples each with a mass of at least 0.5 kg, is to be extracted as evenly as possible from the stock, the transport vehicle or from the pallet and container and so forth.

3.2 Mass

From one of the 5 spot samples, a random quantity of between 20 g and 100 g (approximately 20 pellets) is to be taken and measured.

3.3 Apparent density

In accordance with 3.2, from each of the five spot samples two pellets are to be taken. The determination of the respective apparent density is made in accordance with DIN 52182. The arithmetic mean value calculated from the 10 individual values is to be compared with the corresponding tolerance values (Table 1).

Note:
Because of the size of the samples, it must be assumed that the accuracy of measurement for the determination of the volume of the class HP1 pellets demanded in DIN 52182 cannot be maintained. As a result, a deviation of the mean value from the tolerance limit of 0.02 kg/dm^3 is authorised.

3.4 Preparation of a mixed sample

For the further inspections, (3.5 to 3.11 inclusive) a mixed sample is to be created from the five spot samples taken in accordance with 3.1.

3.5 Water content

The water content determination is made in accordance with DIN 51718, where the test quantity employed has to be between 10 g and 100 g. Deviating from DIN 51718 a non-ground sample can also be used. In accordance with DIN 51718 the dry temperature in procedures A or B must be 103 °C ± 2 °C.

3.6 Ash content

The ash content determination is made in accordance with DIN 51719 (at 815 °C).

3.7 Net calorific value

The determination of the net calorific value is made by calculation from the gross calorific value. The gross calorific value is determined in accordance with DIN 51900-1 to 51900-3.

The standard taken as a basis for the determination is to be indicated in the test report.

Note:
If an elemental analysis is not completed, the following values for the hydrogen content are valid:

Softwoods (coniferous)	6,2 %
Hardwoods (deciduous)	6,0 %

3.8 Sulphur content

The determination is made in accordance with DIN 51724-1 or through comparable methods.

3.9 Nitrogen content

The determination is made in accordance with DIN 51722-1 or through comparable methods.

3.10 Chlorine content

The determination is made in accordance with DIN 51727 or through comparable methods.

3.11 Pellet abrasion

The determination of the abrasion behaviour is made using the following test specification with the Ligno-Tester or an equivalent test appliance (refer to section 7).

The fine particle share is to be separated before determining the abrasion through manual sieving with a 3.15 mm sieve in accordance with DIN ISO 3310-1.

A quantity of pellets are weighed, 100 g ± 0,5 g, and subjected to an air stream of 70 mbar for 60 seconds in the Ligno-Tester. Afterwards the pellets are reweighed and the abrasion calculated in percent (%). The mean value is established from the results of 5 determinations. The pellets must be tested free of fine particle share. The Ligno-Testers dust filter should be changed after every third determination test.

$$AR = \frac{m_E - m_A}{m_E} \cdot 100$$

AR Abrasion in %
m_E Weight-in quantity in g
m_A Weight-out quantity in g

The abrasion can also be determined by means of an equivalent method. The equivalence of a method is to be verified in accordance with section 7.

Note:
Because of the expected deviation during the determination, a discrepancy of the mean value from the tolerance limit of 0.2 % abrasion is authorised.

3.12 Identifying marking

- Quality mark DIN*plus* with corresponding registrations number;
- Diameter, d, in mm e.g. Wood pellets – diameter 6 mm;
- Notice, that during transport and storage the pellets are to be protected from moisture;
- For the non-ambiguous identification of the delivery, every product or its packaging must be labelled with an identification number/code and/or a serial number. At the very least this identification must give information concerning the year of production and the manufacturing plant (where appropriate information regarding the Austrian standardisation institute, ON, registration number). The encoding must be declared to DIN CERTCO.

With unpacked consignments, corresponding information is to be found on the accompanying documents.

4 Process of product certification

4.1 Pre-licence factory inspection

A condition for the implementation of the inspection, in accordance with this certification scheme, is a previous appraisal by the DIN CERTCO appointed and approved test laboratory. As a result, the QM measures for continuous self-monitoring in accordance with section 5.2 and the corresponding documentation are checked.

For each manufacturing site a factory inspection is to be processed, in order to prove the explicit and detailed relation on the surveilled products (e. g. an updated supplement).

4.2 Test and test report

The samples which have been taken during the pre-licence factory inspection have to be tested in a DIN CERTCO-testing laboratory according to the requirements as specified in section 1 and 3.

The test report must contain the following additional information:

- Date and location of facility inspection
- Information about the manufacturing site and year of production
- Duration of inspection
- Name and function of the inspector
- Test results

5 Conformity surveillance

5.1 Factory production control

The factory production control must be executed by qualified personnel at least once a week and include the following examinations:

1. Determination of apparent density
2. Determination of water content
3. Determination of the abrasion behaviour in accordance with 3.11
4. Documentation of the type and quantity of any auxiliary press material used.

For the purpose of the self-monitoring, the methods stated in section 3 do not have to be employed. However, it should be guaranteed that the methods employed allow a safety margin referring to the limit values determined by the reference method.

The results of the self-monitoring are to be documented and subsequently inspected by the test laboratory during the third-party surveillance.

5.2 Third-party surveillance

The third-party surveillance is the inspection of the pellets based on a surveillance contract (refer to 5.1). The inspection takes place without prior announcement and must be made at every manufacturing plant. Within the framework of the third-party surveillance, the following measures will be implemented:

1. Inspection of the factory's production control of the manufacturer (facility inspection)
2. Inspection of the type and quantity of the auxiliary press material used (e.g. supported by delivery documents) with reference to the production quantity
3. Sampling of the respective product according to section 3.1
4. Inspection of the pellets according to sections 2 and 3.

6 Time limit for the eradication of deficiencies

The time limit for the eradication of a deficiency discovered during the inspections, made in accordance with section 5, is determined by the test laboratory and is a maximum of 6 weeks. After this, a further third party surveillance is to be executed.

If further deficiencies are determined, the DIN*plus*-mark usage rights will expire. The product will be deleted from the directories.

7 Verification of the equivalence of a method for the abrasion determination

7.1 Abrasion determination with homogeneous test material by means of a reference test method

For the analysis, a homogeneous test material (no mixed sample, constant water content, smallest possible differences in the length) is to be employed.

The determination of the abrasion with homogeneous test material is made in accordance with section 3.11, where the mean value is to be determined not from 5, but from 15 randomly taken spot samples. In addition to the mean value, the standard deviation is also to be determined. If the standard deviation is less than 0.20 % abrasion, it can be assumed that the test material is homogeneous. If the standard deviation is greater than or equal to 0.20 %, then the material employed is to be classified as non homogeneous. In this case, the analysis must be carried out again with material that is more suitable.

7.2 Abrasion determination by means of a comparable method

If it can be proven that the test material fulfils the homogeneity criterion demanded, a further 15 spot samples are to be taken randomly. The test quantity to be taken depends on the respective requirements of the comparison method. The abrasion determination must be made according to a precisely defined test procedure (description as in 3.11 and/or information of a corresponding standard). In turn, from the 15 determinations the arithmetic mean value and the corresponding standard deviation are to be determined.

7.3 Comparison of reference and comparable method

The proof as to whether both methods differ significantly from each other has to be made by the T-Test of two independent random samples (bilateral question formulation, error probability ≤ 1 %). In addition, it should be checked whether the homogeneity criterion demanded (standard deviation < 0,20 %) could also be maintained with the comparable method. If, with an assumed error probability of 1 %, no significant difference between both methods can be detected, and if the standard deviation calculated by means of the comparable method from the 15 abrasion values is less than 0.20 % then the comparable method is recognised as equal when compared to the method stated in 3.11.