

**Ordinance**  
**on the Management of Waste Wood<sup>\*)</sup>**

dated 15 August 2002

On the basis of

- Article 7 para. 1 nos. 2, 3, 5 and 6, Article 7 para. 3, Article 12 para. 1 nos. 1 to 3, Article 41 para. 1 second sentence and para. 3, and Article 48 nos. 1 and 2 of the Closed Substance Cycle and Waste Management Act [*Kreislaufwirtschafts- und Abfallgesetz*] of 27 September 1994 (Federal Law Gazette I p. 2705), Article 17 para. 1 no. 1 letters a to c and paras. 3 and 5 of the Chemicals Act [*Chemikaliengesetz*] in the version published on 25 July 1994 (Federal Law Gazette I p. 1703), and Article 7 para. 1 no. 1 of the Federal Immission Control Act [*Bundes-Immissionsschutzgesetz*] in the version published on 14 May 1990 (Federal Law Gazette I p. 880), after hearing the parties concerned, and
- Article 7 para. 1 nos. 1 and 4, in each case in conjunction with Article 59 of the Closed Substance Cycle and Waste Management Act of 27 September 1994 (Federal Law Gazette I p. 2705), after hearing the parties concerned and while preserving the rights of the *Bundestag* [*German Federal Parliament*]

the *Bundesregierung* [*German Federal Government*] decrees as follows:

---

<sup>\*)</sup> The obligations arising from Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations (OJ EC No. L 204 p. 37), as amended by European Parliament and Council Directive 98/48/EC of 20 July 1998 (OJ EC No. L 217 p. 18), have been met.

**§ 1**

**Ordinance**

***on the Requirements Pertaining to the Recovery and Disposal of Waste Wood***

***(Waste Wood Ordinance)***

*[Altholzverordnung – AltholzV]*

**Article 1**

**Scope**

(1) This Ordinance applies to the

1. substance recycling,
2. energy recovery and
3. disposal

of waste wood.

(2) This Ordinance applies to

1. producers and holders of waste wood,
2. operators of installations in which waste wood is recovered or disposed of,
3. public-law parties responsible for waste wood management if they recover or dispose of waste wood, and
4. third parties, associations and self-administered private corporations to which, in accordance with Article 16 para. 2, Article 17 para. 3 or Article 18 para. 2 of the Closed Substance Cycle and Waste Management Act, obligations have been conferred pertaining to the recovery or disposal of waste wood.

(3) This Ordinance does not apply to the substance recycling of waste wood not covered by para. 1 in conjunction with Article 2 no. 7. This Ordinance also does not apply to installations falling under Article 5 of the Ordinance on Small and Medium-Sized Firing Installations *[Verordnung über kleine und mittlere Feuerungsanlagen]*.

## **Article 2**

### **Definition of Terms**

For the purposes of this Ordinance, the terms below shall be understood as follows:

1. Waste wood:

Residual wood from industry and used wood, insofar as these constitute waste within the meaning of Article 3 para. 1 of the Closed Substance Cycle and Waste Management Act;

2. Residual wood from industry:

Wood residues accumulating in woodworking and machining plants, including derived timber residues accumulating in the derived timber product industry as well as composite products consisting mainly of wood (over 50% by mass);

3. Used wood:

Used products made from solid wood, derived timber products or from composite materials consisting mainly of wood (over 50% by mass);

4. Waste wood category:

a) Waste wood category A I:

Waste wood in its natural state or only mechanically worked which, during use, was at most insignificantly contaminated with substances harmful to wood,

b) Waste wood category A II:

Bonded, painted, coated, lacquered or otherwise treated waste wood with no halogenated organic compounds in the coating and no wood preservatives,

c) Waste wood category A III:

Waste wood with halogenated organic compounds in the coating, with no wood preservatives,

d) Waste wood category A IV:

Waste wood treated with wood preservatives, such as railway sleepers, telephone masts, hop poles, vine poles as well as other waste wood which, due to its contamination, cannot be assigned to waste wood categories A I, A II or A III, with the exception of waste wood containing PCBs;

5. Waste wood containing PCBs:

Waste wood which constitutes waste wood containing PCBs within the meaning of the PCB/PCT Waste Ordinance [*PCB/PCT-Abfallverordnung*] and is to be disposed of in accordance with the provisions of this Ordinance, in particular insulating board and sound insulating board treated with agents containing polychlorinated biphenyls;

6. Wood preservatives:

Substances used in woodworking and machining having a biocidal effect against hylophagous insects and fungi as well as fungi which discolour the wood, as well as substances for reducing the flammability of wood;

7. Substance recycling of waste wood:

- a) processing of waste wood to wood chips for the manufacture of derived timber products,
- b) production of synthetic gas for further chemical use and
- c) manufacture of active carbon/industrial charcoal;

8. Energy recovery from waste wood:

Recovery of waste wood within the meaning of Article 4 para. 4 of the Closed Substance Cycle and Waste Management Act;

9. Waste wood treatment installation:

Installation used for substance recycling or energy recovery from waste wood and installations for sorting or other treatment of waste wood including any attendant storage;

10. Interfering substances:

Inorganic or organic substances which damage wood, particularly soil, stones, concrete, metal parts, paper, cardboard, textiles, plastics or foil which are stuck to, added to or attached to the waste wood, insofar as they prevent recovery.

### **Article 3**

#### **Requirements pertaining to recovery**

(1) In order to ensure safe substance recycling of waste wood, the requirements of Annex I must be complied with. In accordance with Annex I, only the waste wood categories in column 2, taking into account the special requirements for substance recycling listed in column 3, may be used for the recovery methods described in column 1. The wood chips processed for the manufacture of derived timber products may not exceed the limit values specified in Annex II. These shall be deemed to have been complied with if the sliding average value of the four most recent tests conducted in accordance with Article 6 para. 2 does not exceed the limit value and no analysis result exceeds the limit value by more than 25%.

(2) The energy recovery of waste wood shall comply with the provisions of the Federal Immission Control Act and the statutory ordinances issued on the basis thereof.

(3) In the case of a mixture of waste wood from different waste wood categories the requirements pertaining to recovery in each case relate to the highest waste wood category in accordance with paras. 1 and 2. Different contingents of waste wood may only be mixed for the manufacture of derived timber products if the requirements of Annex II have been fulfilled for each of the contingents.

### **Article 4**

#### **High quality of recovery**

The procedures for the substance recycling of waste wood are of high quality. Sentence 1 applies accordingly to the procedures for the energy recovery of waste wood.

## **Article 5**

### **Assignment to waste wood categories**

(1) In order to meet the requirements under Article 3, the operator of a waste wood treatment installation must ensure that only the permissible waste wood categories are used for the intended recovery and that the waste wood used has all interfering substances removed and is free of PCBs. In order to comply with the requirements under sentence 1, the operator of the waste wood treatment installation must take the following measures:

1. The waste wood shall be assigned to the waste wood categories permitted for the intended recovery path by means of visual checks and sorting. If it is suspected that the waste wood has been creosoted, the waste wood must be assigned to category A IV. When assigning waste wood to a category, the type and origin of the waste wood shall be taken into consideration in accordance with Annex III as an assumption of a general rule. Assignment to another waste wood category is permitted in particularly justified exceptional cases. It must be documented in the facility log-book and the reasons for this must be given.
2. Interfering substances must be removed.
3. If it is not possible to assign the waste wood definitively to a particular waste wood category, it must be assigned to a higher category.
4. The personnel employed for the assignment of the waste wood must possess the necessary knowledge. Such knowledge requires in-company training on the basis of an on-the-job training plan.

(2) Separated waste wood and interfering substances, the further disposal of which the installation is not certified to carry out, must immediately be separately prepared and taken to be disposed of in a permissible manner.

## Article 6

### Inspection and monitoring of waste wood for the manufacture of derived wood products

- (1) In order to check that the requirements in accordance with Article 3 para. 1 third sentence and Article 3 para. 3 as well as Article 5 para. 1 pertaining to the processing of waste wood to make wood chips for the manufacture of derived timber products have been complied with, the operator of the waste wood treatment installation must, in accordance with paras. 2 and 3, conduct internal monitoring and, in accordance with para. 6 sentences 1 to 3 and 5, ensure that independent monitoring is conducted on a regular basis.
- (2) The operator of a waste wood treatment installation must, in the course of the processing, sample the wood chips produced in batches of not more than 500 tonnes each. The samples taken shall undergo a colour test to establish whether creosote is present and shall be tested for compliance with the limit values in Annex II, with the exception of the limit values for mercury and polychlorinated biphenyls. The taking, testing and storing of samples shall be carried out in accordance with the procedures described in Annex IV.
- (3) By way of deviation from para. 2 sentence 3, operators of waste wood treatment installations may, with the approval of the competent authority, use simple test procedures with sufficient sensitivity in accordance with the state of the art. The *Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit* [Federal Ministry for the Environment, Nature Conservation and Nuclear Safety] shall publish the relevant test procedures in the Federal Gazette.
- (4) Wood chips may subsequently only be used in the manufacture of derived timber products if the tests and examinations stipulated in paras. 2 and 3 do not indicate any contamination with creosote or that the limit values in Annex II have been exceeded. If these tests and examinations reveal contamination with creosote or that the limit values of Annex II have been exceeded, the sampled batch must be assigned to waste wood category A IV.
- (5) The classification of waste wood as waste requiring special supervision shall be governed by the Waste List Ordinance [*Abfallverzeichnis-Verordnung*]. As a general rule the references to the waste code in Annex III can be taken as the basis for classification. If a mixture of waste wood contains

waste wood that must be classified as waste requiring special supervision, the entire mixture must be classified as waste requiring special supervision.

(6) The operator of the waste wood treatment installation must have a batch tested and examined quarterly by a body appointed by the competent supreme Land authority or by the authority competent under Land law. The records and results of the internal monitoring in accordance with paras. 2 and 3 shall be submitted to this body. Para. 2 applies with regard to the tests and examinations with the proviso that compliance with the limit values for mercury and polychlorinated biphenyls must also be tested. In the case of failure to comply with the limit values for mercury and polychlorinated biphenyls the competent authority can order an examination of these parameters in accordance with para. 2. The operator of the waste wood treatment installation must ensure that he is informed of the results immediately. If the tests and examinations reveal contamination with creosote or that the limit values in Annex II have been exceeded, he must inform the competent authority of this immediately.

## **Article 7**

### **Inspection and monitoring of waste wood intended for energy recovery**

(1) If the use of waste wood in an installation licensed in accordance with the Federal Immission Control Act is restricted to certain waste wood categories, the operator of the waste wood treatment installation must test the crushed waste wood in batches of not more than 500 tonnes each to ensure that all the waste wood assigned to a particular recovery path in accordance with Article 5 para. 1 second sentence no. 1 first sentence has been properly assigned. The test shall be carried out in accordance with Annex V.

(2) The sampled batch may subsequently be taken for further energy recovery only if the proportion of waste wood from higher waste wood categories does not exceed 2 percent in total per sample taken. If the examination reveals a total of more than 2 percent of waste wood from higher categories per sample taken, Article 3 para. 3 shall apply *mutatis mutandis*, provided that the waste wood is not reassigned in accordance with Article 5 para. 1 second sentence no. 1 first sentence. Article 6 para. 5 applies *mutatis mutandis*.

(3) If waste wood is to be used for energy recovery in installations not subject to licensing under the Federal Immission Control Act, the sampled batch may, by way of deviation from para. 2, only subsequently be taken for further energy recovery if it contains no waste wood from higher categories. Para. 2 second sentence applies mutatis mutandis.

(4) Where fodder is dried in direct contact with an installation's exhaust or flames, the use of waste wood in such installation is restricted to waste wood category A I.

(5) More extensive requirements in accordance with the Federal Immission Control Act and the regulations based thereon remain unaffected.

### **Article 8**

#### **Placing of waste wood onto the market**

Waste wood may only be placed onto the market for the purpose of substance recycling or energy recovery in order to be supplied to a waste wood treatment installation which complies with the requirements under Articles 3, 5 to 7 and 12.

### **Article 9**

#### **Disposal of waste wood**

The parties obligated under Article 1 para. 2 must forward waste wood that cannot be recovered to a certified thermal treatment installation for disposal.

## **Article 10**

### **Obligations incumbent upon the producer and the holder to keep waste wood separate**

In the case of waste wood accumulating in quantities totalling more than 1 m<sup>3</sup> of loose bulk volume or 0.3 tonnes per day and PCB-bearing, kyanised or creosoted waste wood, the parties obligated under Article 1 para. 2 must collect the waste wood separately at the site of accumulation according to origin and type as per Annex III or in accordance with the waste wood categories as well as collect, keep ready, relinquish, transport and store it separately insofar as this is necessary to meet the requirements of Articles 3, 8 and 9.

## **Article 11**

### **Notification and labelling obligations**

- (1) Whosoever supplies waste wood to a waste wood treatment installation must declare the category and quantity of the waste wood supplied. The delivery certificate as per Annex VI shall be used to declare the waste wood.
- (2) The operator of a waste wood treatment installation may only accept delivery of the waste wood if he is given a delivery certificate.
- (3) Paras. 1 and 2 shall not apply to the delivery of small amounts of up to 100 kilogrammes.

## **Article 12**

### **Facility log-book**

- (1) The operator of a waste wood treatment installation subject to licensing must keep a facility log-book in accordance with sentence 2 in order to monitor the proper performance of waste wood management in compliance with the requirements laid down in this Ordinance. The following information must be entered without delay in the log-book:

1. any significant deviations from the declaration in accordance with Article 11 para. 1 first sentence noted during assignment in accordance with Article 5 para. 1 second sentence no. 1 first sentence.
2. the results of the internal and independent monitoring in accordance with Article 6 para. 1, including the associated sampling documentation,
3. the results of the inspection of waste wood intended for energy recovery in accordance with Article 7 para. 1,
4. the delivery certificates in accordance with Article 11 para. 1 second sentence,
5. the type, quantity and category of the waste wood to be recovered or disposed of and, in the case of recovery or disposal elsewhere, the type, quantity, category and final destination of the waste wood sent elsewhere,
6. any unusual occurrences, especially disruptions of operations, which could affect the proper recovery and disposal of the waste wood, including specification of the possible causes, and
7. the mitigation measures taken as a consequence of the results of the tests in accordance with Article 5 para. 1 second sentence no. 1 first sentence, Article 6 para. 1 and Article 7 para. 1 or as a result of any unusual occurrences as per no. 6.

(2) The facility log-book shall be regularly reviewed by the person responsible for managing and supervising operations or a person appointed by him. It may be kept by storing the information specified in para. 1 in electronic form or in the form of separate sheets, also for each area of operations or each part of the company, if the information specified in para. 1 is entered legibly in German using a printer, typewriter, ballpoint pen or another writing implement with indelible ink and if such sheets are combined daily. The facility log-book is to be kept in a safe place and protected from unauthorised access. The facility log-book must be available at all times and be available for submission in clear-text form.

(3) The operator of the waste wood treatment installation shall store the information entered in the facility log-book for five years, beginning with the date of entry of the individual items of information, or keep the separate sheets on which the information is entered for five years and, on request, submit the stored information in clear-text form or the separate sheets to the competent authority.

(4) If facility log-books are to be kept pursuant to other provisions, the required information may be consolidated into one facility log-book.

(5) The provisions of the Ordinance on Waste Recovery and Disposal Records [*Nachweisverordnung*], Article 4 of the PCB/PCT Waste Ordinance and Article 5 of the Ordinance on Specialised Waste Management Companies [*Entsorgungsfachbetriebeverordnung*] remain unaffected.

### **Article 13**

#### **Offences**

An offence within the meaning of Article 61 para. 1 no. 5 of the Closed Substance Cycle and Waste Management Act is committed by any person who wilfully or negligently

1. contrary to Article 3 para. 1 second sentence, uses a waste wood category,
2. contrary to Article 3 para. 3 second sentence, mixes waste wood,
3. contrary to Article 5 para. 1 first sentence, does not ensure that only permissible waste wood categories are used and that waste wood has all interfering substances removed and is free of PCBs,
4. contrary to Article 6 para. 1, does not or does not correctly or completely carry out internal monitoring or does not ensure that independent monitoring is carried out,
5. contrary to Article 6 para. 4 first sentence, supplies wood chips for the manufacture of derived timber products,

6. contrary to Article 6 para. 6 sixth sentence, does not or does not correctly, completely or in good time notify the competent authority,
7. contrary to Article 7 para. 2 first sentence or para. 3 first sentence, supplies a sampled batch for further energy recovery,
8. contrary to Article 8, places waste wood on the market,
9. contrary to Article 9, does not forward waste wood to a thermal treatment installation,
10. contrary to Article 11 para. 1 first sentence, does not or does not correctly, completely or in good time declare the waste wood,
11. contrary to Article 11 para 2, accepts delivery of waste wood,
12. contrary to Article 12 para. 1 first sentence, does not or does not correctly or completely keep a facility log-book or
13. contrary to Article 12 para. 3, does not store an item of information in the facility log-book or does not store the same for at least five years, or does not keep a separate sheet or does not keep the same for at least five years, or does not or does not in good time submit an item of information or a separate sheet.

**Annex I**  
(re Article 3 para. 1)

Methods for the substance recycling of waste wood

Column 1		Column 2				Column 3
No.	Recovery method	Permissible waste wood categories				Special requirements
		A I	A II	A III	A IV	
1	Processing of waste wood to wood chips for the manufacture of derived timber products	Yes	Yes	(Yes)		The processing of waste wood from category A III is only permissible if varnishes and coatings have been largely removed by pretreatment or will be largely removed during processing.
2	Production of synthetic gas for further chemical use	Yes	Yes	Yes	Yes	Recycling is only permitted in installations licensed for this purpose under Article 4 of the Federal Immission Control Act.
3	Manufacture of active carbon/industrial charcoal	Yes	Yes	Yes	Yes	Recycling is only permitted in installations licensed for this purpose under Article 4 of the Federal Immission Control Act.

**Annex II**  
(re Article 3 para. 1)

Limit values for wood chips used  
in the manufacture of derived timber products

Column 1	Column 2
Element/compound	Concentration (milligrams per kilogram dry mass)
Arsenic	2
Lead	30
Cadmium	2
Chromium	30
Copper	20
Mercury	0.4
Chlorine	600
Fluorine	100
Pentachlorophenol	3
Polychlorinated biphenyls	5

**Annex III**  
(re Article 5 para. 1)

Usual assignment of the common types of waste wood

Common types of waste wood		Usual assignment	Waste code	
Wood waste from woodworking and machining	Waste, cuttings, shavings from solid wood in its natural state	A I	03 01 05	
	Waste, cuttings, shavings from derived timber products and other treated wood (with no harmful contaminants)	A II	03 01 05	
Packaging	Palettes	Palettes made from solid wood such as: Europalettes, industrial palettes made from solid wood	A I	15 01 03
		Palettes made from derived timber products	A II	15 01 03
		Other palettes with composite materials	A III	15 01 03
	Transport cases, crates made from solid wood	A I	15 01 03	
	Transport cases made from derived timber products	A II	15 01 03	
	Boxes for fruit, vegetables and ornamental plants as well as similar boxes made from solid wood	A I	15 01 03	
	Ammunition boxes	A IV	15 01 10*	
	Cable reels made from solid wood (made before 1989)	A IV	15 01 10*	
	Cable reels made from solid wood (made after 1989)	A I	15 01 03	
Waste wood from the construction industry	Waste wood from building sites	Solid wood in its natural state	A I	17 02 01.
		Derived timber products, barked wood, treated solid wood (with no harmful contaminants)	A II	17 02 01
	Waste wood from demolition and restoration work	Boards, false ceilings, planks from interior works (with no harmful contaminants)	A II	17 02 01
		Door leaves and frames (with no harmful contaminants)	A II	17 02 01
		Profile boards for the fitting out of rooms, ceiling panels, ornamental beams etc. (with no harmful contaminants)	A II	17 02 01
		Heat and sound insulating board treated with agents containing polychlorinated biphenyls	Disposal	17 06 03*
		Chipboard used in construction	A II	17 02 01
		Wood used in construction for load-bearing elements	A IV	17 02 04*
		Timber framework and rafters	A IV	17 02 04*
		Windows, window posts, outer doors	A IV	17 02 04*
	Impregnated wood used in external structures	A IV	17 02 04*	
	Wood from construction and demolition work containing harmful contaminants		A IV	17 02 04*
		Impregnated waste wood used in external structures	Railway sleepers	A IV
Telephone masts			A IV	17 02 04*
Various wood used in horticulture and landscaping, impregnated garden furniture			A IV	17 02 04*
Various wood used in agriculture	A IV		17 02 04*	
Furniture	Furniture, solid wood in its natural state	A I	20 01 38	
	Furniture, with no halogenated organic compounds in the coating	A II	20 01 38	
	Furniture, with halogenated organic compounds in the coating	A III	20 01 38	
Waste wood from bulky refuse (mixed)		A III	20 03 07	
Waste wood from industrial use (e.g. industrial flooring, cooling towers)		A IV	17 02 04*	
Waste wood from hydraulic engineering		A IV	17 02 04*	
Waste wood from dismantled vessels and goods waggons		A IV	17 02 04*	
Waste wood from damaged structures (e.g. burnt wood)		A IV	17 02 04*	
Fine fraction from the processing of waste wood to make derived timber products		A IV	19 12 06*	

Stipulations relating to the analysis of wood chips used  
in the manufacture of derived timber products

**1 Testing of wood chips**

**1.1 Sampling**

Sampling in accordance with Article 6 shall be carried out by persons possessing the necessary expertise for the taking of samples. The samples to be examined shall be taken from running production. One sample of at least 2 l shall be taken from at least every 10 tonnes of the material flow, using, for example, a vessel designed to be held in the throw-off of a conveyor belt. Sampling shall be documented. The documentation shall contain at least the date of the sample, identification of the batch from which the sample was taken and the name and signature of the person carrying out the sampling, affirming that sampling was carried out properly. The samples shall be transported and stored so as to exclude, as far as possible, any effect on the chemical, physical and biological nature of the sample material.

**1.2 Creation of the laboratory sample**

For each batch to be tested, a laboratory sample shall be provided for analytical tests. For this purpose, the individual samples shall be combined in a mixed sample on a clean, smooth base and homogenised by means of repeated mingling. A laboratory sample of 500 g shall be removed from the mixed sample with appropriate sample dividers or by means of coning and quartering in accordance with DIN 51701, Part 3 (August 1985 edition). The laboratory sample shall be divided after drying. Half of the laboratory sample shall be used as a reserve sample. This shall be labelled with the date and the analysis number and kept for at least six months.

### **1.3 Preparation of the samples**

The laboratory sample to be prepared for analysis shall be air-dry. Damp material shall be dried before preparation in a well ventilated place or in a laboratory drying cupboard (maximum drying temperature: 40 °C). The laboratory sample shall be ground to a grain size of < 2 mm in a suitable grinder (cross grinder or cutting mill), if appropriate, while cooled using liquid nitrogen.

### **1.4 Carrying out of the tests**

For each test parameter at least two parallel analyses shall be carried out.

#### **1.4.1 Determination of the moisture content**

Determination of the moisture content shall be carried out in accordance with DIN 52183 (November 1977 edition). The results shall be stated in percent by weight.

#### **1.4.2 Determination of the chlorine and fluorine content**

The air-dry, ground waste wood samples shall be broken down by means of oxidation in accordance with DIN 51727 (June 2001 edition). The chloride and fluoride content in the breakdown solution shall be determined using ion chromatography in accordance with DIN EN ISO 10304, Part 1 (April 1995 edition). The results shall be stated in milligrams per kilogram dry mass.

#### **1.4.3 Analysis methods for arsenic, lead, cadmium, chromium, copper and mercury**

The air-dry, ground waste wood samples shall be broken down using aqua regia in accordance with DIN EN 13657 (Draft October 1999). The concentrations of the elements in the breakdown solution shall be measured in accordance with one of the following analysis methods:

<u>Element</u>	<u>Analysis method(s)</u>
Arsenic	DIN EN ISO 11969 (November 1996 edition)
Lead	DIN 38406, Part 6 (July 1998 edition) DIN EN ISO 11885 (April 1998 edition) DIN ISO 11047 (May 1998 edition)
Cadmium	DIN EN ISO 5961 (May 1995 edition) DIN EN ISO 11885 (April 1998 edition) DIN ISO 11047 (June 1995 edition)
Chromium	DIN EN 1233 (August 1996 edition) DIN EN ISO 11885 (April 1998 edition) DIN ISO 11047 (June 1995 edition)
Copper	DIN 38406, Part 7 (September 1991 edition) DIN EN ISO 11885 (April 1998 edition) DIN ISO 11407 (June 1995 edition)
Mercury	DIN EN 1483 (August 1997 edition) DIN EN ISO 12338 (October 1998 edition).

The results shall be stated in milligrams per kilogram dry mass.

#### **1.4.4 Analysis for pentachlorophenol (PCP)**

##### **1.4.4.1 Process principle**

Pentachlorophenol and its salts shall be extracted in an ultrasonic bath using methanol and, after acetylation, quantified by means of gas chromatography with electron capture detection (GC ECD). This procedure can be used to detect PCP in ground wood within the concentration range of 0.1 mg/kg to 100 mg/kg.

#### **1.4.4.2 Equipment**

- Ultrasonic bath with thermostat
- Gas chromatograph with electron capture detector and autosampler

#### **1.4.4.3 Chemicals and standards**

- Methanol for residue analysis
- Cyclohexane and n-hexane for residue analysis
- Na<sub>2</sub>SO<sub>4</sub>, anhydrous, granulated
- PCP as standard in methanolic solution
- 2,4,6-tribromophenol (TBP) in methanolic solution as internal standard 1 (ISTD 1)
- PCB 52 as standard in cyclohexane as internal standard 2 (ISTD 2)
- Acetic anhydride for the analysis
- K<sub>2</sub>CO<sub>3</sub> solution (0.1 mol/l)
- Sea-shore sand, cleaned

#### **1.4.4.4 Measures for preparing the samples**

##### **1.4.4.4.1 Cleaning the equipment**

The glass equipment shall be cleaned by washing with water containing detergent and distilled water, and finally rinsed with acetone and n-hexane.

##### **1.4.4.4.2 Creation of the calibration solutions**

The stock solutions shall be created by weighing out solid substances of maximum purity and stored in the dark at –20 °C.

Concentrations of the stock solutions:	PCP in methanol	0.5 mg/ml
	TBP in methanol	0.5 mg/ml
	PCB 52 in cyclohexane	0.5 mg/ml.

Standard solutions with a concentration of 0.05 mg/ml shall be created from the stock solution by means of dilution (1 : 10).

#### 1.4.4.4.3 Calibration

Calibration is carried out for the whole procedure. For this, 20 µl, 50 µl, 100 µl, 200 µl and 500 µl of the PCP standard solution each with 250 µl of the TBP standard solution is poured onto 5 g of sea-shore sand and prepared as described below for the performance of the analysis (i.e. using sea-shore sand instead of wood).

Example of a calibration:

Calibration solution	PCP [ng/ml]	TBP [ng/ml] ISTD 1	PCB 52 [ng/ml] ISTD 2
1	1.0	10.0	20.0
2	2.0	10.0	20.0
3	5.0	10.0	20.0
4	10.0	10.0	20.0
5	20.0	10.0	20.0

#### 1.4.4.5 Preparation of the samples

##### 1.4.4.5.1 Extraction

According to the expected concentrations, 1 g, 3 g or 4 g of wood is weighed out into a separate Erlenmeyer flask. 250 µl of TBP solution (ISTD 1) is poured onto the wood. The solution shall be left for 30 minutes to react. Then 50 ml of methanol shall be added to the wood and it shall be subjected to ultrasonic treatment for two hours at 40 °C. Once the solid matter has settled, the extract (approximately 25 ml) shall be carefully removed using a Pasteur pipette, transferred to a sealable glass vessel and stored for further processing.

##### 1.4.4.5.2 Acetylation

30 ml of a 0.1 molar K<sub>2</sub>CO<sub>3</sub> solution shall be put into a 150 ml separating funnel, an aliquot of the extract (for example 1 ml) shall be added to this and the funnel shaken for five minutes. Following the addition of 2 ml of acetic anhydride, it shall be shaken for two minutes. Next, 20 ml of cyclohexane shall be added and then it shall be shaken for ten minutes. The aqueous phase shall be discarded and the organic phase shall be filtered

via a glass column filled with  $\text{Na}_2\text{SO}_4$  into a 25 ml measuring flask. After adding 10  $\mu\text{l}$  of the ISTD 2 solution it shall be topped up to precisely 25 ml. This solution shall be used for the GC ECD analysis. The PCP concentration in the extract must lie within the range covered by the calibration solutions.

#### 1.4.4.6 Analysis using GC ECD

GC requirements (example):

Column: HP-5 30 m; 0.25 $\mu\text{m}$ ; 0.32 mm ID

Oven temperature:	50 °C (1 min) $\xrightarrow{20\text{ °C/min}}$ 160 °C (0 min) $\xrightarrow{8\text{ °C/min}}$ 310 °C (5 min)
Detector temperature:	350 °C
Injector temperature:	250 °C
Injector mode:	split/splitless
Carrier gas:	$\text{H}_2$ initial column pressure (35 kPa)
Make up – Gas:	$\text{N}_2$ (60 ml/min)

The following measurements shall be carried out:

- Blank readings:
  - Blank reading for the equipment (pure cyclohexane)
  - Chemical blank reading (carrying out the whole procedure without wood samples)
  - Analysis of contaminant-free wood
- Calibration solutions
- Sample extracts following the preparation described.

To ensure the quality of the analysis results, the percentage recoveries of the acetylated internal standard 1 (tribromophenol) shall be continuously tested against those of internal standard 2 (PCB 52).

#### 1.4.4.7 Evaluation

##### 1.4.4.7.1 Principle

Firstly, a calibration line is drawn using the standard solutions (see Article 1.4.4.7.2), then the determination of the PCP content in a sample extract is added using this calibration line (see Article 1.4.4.7.3).

##### 1.4.4.7.2 Calibration for the whole procedure

To draw the calibration line, the peak-area ratio of acetylated PCP standard to acetylated TBP is plotted against the corresponding concentration ratio in accordance with the following equation:

$$\frac{a_{\text{PCP}}}{a_{\text{TBP}}} = s \times \frac{c_{\text{PCP}}}{c_{\text{TBP}}} + b$$

where:

$a_{\text{PCP}}$  measured reading of the acetylated PCP standard (for example peak area)

$a_{\text{TBP}}$  measured reading of the acetylated TBP standard (for example peak area)

$s$  the gradient of the calibration line

$c_{\text{PCP}}$  the mass per unit volume of the acetylated PCP in the calibration solution in ng/ml

$c_{\text{TBP}}$  the mass per unit volume of the acetylated TBP in the calibration solution in

ng/ml

$b$  the ordinate intercept of the calibration line

Calculation of the PCP content:

The PCP content of the wood sample may be determined in accordance with the following equation from the multipoint calibration line:

$$\text{Gehalt}_{\text{PCP}} = \frac{a_{\text{PCP}}/a_{\text{TBP}} - b}{s \times m} \times c_{\text{TBP}} \times f \times v : 1000$$

Gehalt = Content

where:

Gehalt <sub>PCP</sub>	content of PCP in the sample in mg/kg
c <sub>TBP</sub>	the mass per unit volume of the TBP in the sample extract in ng/ml
m	the mass of the wood used for the extraction in g
a <sub>TBP</sub>	measured reading of the TBP standard in the sample extract (for example peak area)
a <sub>PCP</sub>	measured reading of the analysed PCP in the sample extract (for example peak area)
f	the ratio of the total volume of the extract to the volume of the aliquot for derivatisation (for example 50 ml/2 ml = 25)
v	the volume of the final solution for analysis in ml (for example 25 ml)
s	the gradient of the calibration line
b	the ordinate intercept of the calibration line.

#### 1.4.4.7.3 Indication of the results

The results shall be stated in milligrams per kilogram dry mass.

#### 1.4.5 Determination of the polychlorinated biphenyl (PDB) content

The air-dry, ground waste wood sample shall be extracted in the Soxhlet following addition of an internal standard with n-hexane or using an equivalent extraction method. PCB congeners contained in the extract shall be freed from any interfering accompanying substances using suitable purification steps, in particular a combination of a benzol sulphonic acid separating column with a silica gel column. Determination of the PCB congeners (IUPAC Nos. 28, 52, 101, 138, 153, 180) shall be carried out using capillary gas chromatography with an electron capture detector (ECD) in application of DIN 38414, Part 20 (January 1996 edition). The total PCB content is derived from the sum of the percentage mass determined for each of the PCB congeners, based on the dry mass of the waste wood sample, multiplied by the factor five and rounded to 0.1 mg/kg.

The *Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit* may, for the determination of the polychlorinated biphenyl content publish other scientifically recognised test procedures in the Federal Gazette if corresponding scientific findings are available.

### **1.5 Other methods**

The competent authority shall permit the use of other methods if their equivalence is demonstrated.

## **2 Indication and calculation of the results**

The results of each of the two parallel determinations and their arithmetical mean shall be stated. The arithmetical mean shall be taken into account in testing for compliance with the limit values specified in Annex II. Averaging is only permissible if the difference between the two individual values does not exceed the reproducibility in accordance with DIN ISO 5725, Part 1 (November 1997 edition) that is usual for this method. In cases where the individual values do exceed this reproducibility, it is necessary to investigate possible causes of the excessive difference and to carry out a third measurement.

If investigation of the excessive difference does not reveal any clear cause, the middle of the three individual values in order of size (median) shall be used to test compliance with the limit values in Annex II.

## **3 Quality assurance and control**

The testing bodies are obliged to safeguard the results of the analysis by means of suitable measures for internal and external quality assurance in accordance with DIN EN ISO/IEC 17025 (April 2000 edition). This includes, *inter alia*, the keeping of quality control charts, the use of reference material and the positive participation in collaborative tests.

## **4 Publications of specialist bodies**

The ISO standards, EN standards and DIN standards referred to in this Annex have been published by Beuth-Verlag GmbH, Berlin and Cologne, and are securely archived at the German Patent and Trade Mark Office in Munich.

### Testing of waste wood intended for energy recovery

Sampling in accordance with Article 7 shall be carried out by persons possessing the necessary expertise for the taking of samples. The samples to be examined shall be taken from running production of crushed waste wood. For at most every 10 tonnes of the batch to be sampled, at least 20 kg of waste wood shall be taken from the material flow by means of a drop-release device. From the samples of waste wood taken in this way, quantities of impermissible waste wood categories in accordance with the requirements of Article 5 shall be removed and their mass determined.

**Annex VI**  
(re Article 11)

Delivery certificate for waste wood

Delivery certificate for waste wood				
Supplier (Company/contact):		Date:		
Street:				
Post code and town:				
Telephone:				
Origin of the material:				
Common types of waste wood	Usual assignment to a waste wood category	Waste wood category of the waste wood supplied	Quantity	
			(t)	(m <sup>3</sup> )
Waste, cuttings, shaving from solid wood in its natural state	A I			
Waste, cuttings, shaving from derived timber products and other treated wood (with no harmful contaminants)	A II			
Palettes from solid wood such as: Europalettes, industrial palettes made from solid wood	A I			
Palettes made from derived wood products	A II			
Other palettes with composite materials	A III			
Transport cases, crates made from solid wood	A I			
Transport cases made from derived timber products	A II			
Boxes for fruit, vegetables and ornamental plants as well as similar boxes made from solid wood	A I			
Ammunition boxes	A IV			
Cable reels made from solid wood (made before 1989)	A IV			
Cable reels made from solid wood (made after 1989)	A I			
Variety of solid wood in its natural state from building sites	A I			
Derived timber products, barked wood, treated solid wood (with no harmful contaminants) from building sites	A II			
Boards, false ceilings, planks from interior works (with no harmful contaminants)	A II			
Door leaves and frames (with no harmful contaminants)	A II			
Profile boards for the fitting out of rooms, ceiling panels, ornamental beams etc. (with no harmful contaminants)	A II			
Heat and sound insulating board treated with agents containing polychlorinated biphenyls	Disposal			
Chipboard used in construction	A II			
Wood used in construction for load-bearing elements	A IV			
Timber framework and rafters	A IV			
Windows, window posts, outer doors	A IV			
Impregnated wood used in external structures	A IV			
Wood from construction and demolition work containing harmful contaminants	A IV			

<b>Delivery certificate for waste wood</b>				
Supplier (Company/contact):		Date:		
Street:				
Post code and town:				
Telephone:				
Origin of the material:				
Common types of waste wood	Usual assignment to a waste wood category	Waste wood category of the waste wood supplied	Quantity	
			(t)	(m <sup>3</sup> )
Railway sleepers	A IV			
Telephone masts	A IV			
Various wood used in horticulture and landscaping, impregnated garden furniture	A IV			
Various wood used in agriculture	A IV			
Furniture, solid wood in its natural state	A I			
Furniture, with no halogenated organic compounds in the coating	A II			
Furniture, with halogenated organic compounds in the coating	A III			
Waste wood from bulky refuse (mixed)	A III			
Waste wood from industrial use (e.g. industrial flooring, cooling towers)	A IV			
Waste wood from hydraulic engineering	A IV			
Waste wood from dismantled vessels and goods waggons	A IV			
Waste wood from damaged structures (e.g. burnt wood)	A IV			
Fine fraction from the processing of waste wood to make derived timber products	A IV			
Wood chips				
Other waste wood (specify below) _____				
Additional information for the operator of the waste wood treatment installation (if necessary):  				
Supplier (Company/contact):		Street:		
		Post code and town:		
		Telephone:		
..... (Signature of the supplier)				

## § 2

### *Amendment to the Prohibition of Chemicals Ordinance*

#### *[Chemikalien-Verbotsverordnung]*

The Prohibition of Chemicals Ordinance in the version published on 19 July 1996 (Federal Law Gazette I p. 1151), most recently amended by § 1 of the Ordinance of 13 August 2002 (Federal Law Gazette I p. 3185), is amended as follows:

1. In Article 1 para. 2 no. 2 the words “of proper waste disposal” shall be replaced by the words “for disposal of waste in a manner compatible with the public interest”.
2. The Annex re Article 1 is amended as follows:
  - a) Section 13 column 3 para. 1 is amended as follows:
    - aa) In no. 1, after the word “cleaning” the word “and” is replaced by a comma.
    - bb) In no. 2, the full stop at the end of the sentence is replaced by a comma.
    - cc) After no. 2, the following nos. 3 and 4 are added:
      - “3. the placing of waste wood on the market for the purpose of recovery in accordance with the Waste Wood Ordinance, and
      4. wood chips, derived timber products and products manufactured therefrom which do not contain a total of more than 5 mg/kg of the substances specified in column 1.”
  - b) In Section 15 column 3, the following para. 3 is added after para. 2:

“(3) The prohibition under column 2 no. 3 does not apply to waste wood placed onto the market for the purpose of recovery in accordance with the Waste Wood Ordinance.”
  - c) In Section 17 column 3 the following para. 4 is added after para. 3:

“(4) The prohibition under column 2 no. 2 does not apply to waste wood placed onto the market for the purpose of recovery in accordance with the Waste Wood Ordinance.”

§ 3

*Amendment to the Ordinance on Hazardous Substances*

*[Gefahrstoffverordnung]*

The Ordinance on Hazardous Substances in the version published on 15 November 1999 (Federal Law Gazette I p. 2233; 2000 I p. 739), most recently amended by § 2 of the Ordinance of 13 August 2002 (Federal Law Gazette I p. 3185), is amended as follows:

1. In Article 15 para. 2 the words “proper waste disposal” is replaced by the words “disposal of waste in a manner compatible with the public interest”.
2. Annex IV is amended as follows:
  - a) In no. 12, the following para. 3 is added after para. 2:

“(3) Para. 1 no. 4 does not apply to waste wood which is recovered in accordance with the Waste Wood Ordinance.”
  - b) In no. 13.3, the following para. 3 is added after para. 2:

“(3) The prohibition under no. 13.1 para. 2 does not apply to waste wood which is recovered in accordance with the Waste Wood Ordinance.”
  - c) In no. 14 para. 2, the following nos. 4a and 4b are inserted after no. 4:

“4a. Waste wood which is recovered in accordance with the Waste Wood Ordinance,  
4b. Wood chips, derived timber products and products manufactured therefrom which do not contain a total of more than 5 mg/kg of the substances specified in para. 1 nos. 1 to 5.”

**§ 4**

***Amendment to the Ordinance on Waste Recovery and Disposal Records***

Article 8 para. 1 of the Ordinance on Waste Recovery and Disposal Records in the version published on 17 June 2002 (Federal Law Gazette I p. 2374), as amended by § 6 of the Ordinance of 24 June 2002 (Federal Law Gazette I p. 2247), is amended as follows:

1. Sentence 1 is amended as follows:

- a) In no. 1, the comma is deleted after the word “Oils” and the following half-sentence is added:

“or in the case of waste wood collection belongs to the same waste wood category A I to A IV pursuant to Annex III re Article 5 para. 1 of the Waste Wood Ordinance of 15 August 2002 (Federal Law Gazette I, p. 3302) where separate storage is not prescribed by the Waste Wood Ordinance;”

- b) No. 4 is amended as follows:

aa) The words “waste oils referred to in no. 1 the waste oils collected” are replaced by the words “waste oils or waste wood referred to in no. 1 the quantity collected”.

bb) The words “or per waste wood category” are added after “collection category”.

2. Sentence 2 is worded as follows:

“In the case of collection of waste oils or waste wood in accordance with the first sentence of no. 1, the record of proper waste management can be submitted by using the code of waste which defines the respective waste oil collection category or waste wood category.”

**§ 5**

***Entry into force***

This Ordinance shall enter into force on the first day of the seventh calendar month following promulgation.

---

The *Bundesrat [Länder representation in German Parliament – second chamber of German Parliament]* has given its consent.

Berlin, 15 August 2002

*Der Bundeskanzler*

*[The Federal Chancellor]*

Gerhard Schröder

*Der Bundesminister für Umwelt, Naturschutz und Reaktorsicherheit*

*[The Federal Minister for the Environment, Nature Conservation and Nuclear Safety]*

Jürgen Trittin

*Der Bundesminister für Arbeit und Sozialordnung*

*[The Federal Minister for Labour and Social Affairs]*

Walter Riester