

Ring test

Organic and inorganic contaminants in waste wood

P2539-RT



Summary

The entire report is available to participants only.

The ring test was designed on behalf of PROOF-ACS GmbH by

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The ring test was realised, evaluated, authorised and the report was approved by

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PROOF-ACS GmbH does not have any analytical laboratory facilities of its own. Homogeneity testing and stability testing are subcontracted to laboratories, accredited according to DIN EN ISO 17025. The subcontracted laboratory may also participate in the ring tests. If so, the laboratory is treated in the same way as other participants and the same rules of confidentiality apply.

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The proficiency test evaluates the performances of laboratories with respect to their ability to identify and quantify organic and inorganic contaminants in waste wood.

Heavy metals and toxic metals, F, Cl, PCBs, PCP, as well as the general parameters moisture content, ash content, gross calorific value, and net calorific value, and the elementary analysis of C, H, N, S, and O are covered by the test.

A test material is prepared by blending of a not contaminated wood material with a contaminated wood material. The tests material is spiked with Hg, F, and PCBs, while the other parameters are considered based on the concentration levels present in the wood material after blending.

14 laboratories from Germany took part in the test. All 14 labs reported results and are considered for evaluation. The laboratories are free to analyse the test material for all parameters or for a selection of it only. The parameters ash content, gross calorific value, and net calorific value, as well as the elementary analysis of C, H, N, S, and S are offered as an additional module, which is booked by 9 out of 14 labs.

The performance of laboratories in the test is evaluated according to

- the identification of the spiked PCBs. PCBs, which are not reported and not marked as “not analysed” are considered false negative. Results related to the unspiked PCB 52 at relevant concentration levels (> 0.05 mg/kg DM) are considered false positive.
- the comparability of the results. The evaluation of the comparability is based on the z-score model. The absolute value of the z-score should be at least ≤ 2 . The comparability criterion is applied to all parameters except for the elementary analysis.
- the trueness of the results. The trueness is expressed as the coverage of the spiked level in %. The coverage should be at least between 70 and 120 % of the spiked level. The trueness criterion is applied to the spiked parameters Hg, F, and PCBs. It is not applicable to the other parameters in the test.

The parameters, the spiked levels as well as a summary of the overall results of the labs are summarised in the tables below.

To summarise:

- 14 laboratories reported results. 9 labs ordered the additional module.
- 11 labs reported results related to the metals in general, while 12 labs reported results related to Hg.
- 12 labs analysed the test material for PCP and PCBs
- 11 labs reported results related to Cl and F.
- 7 labs reported results related to the gross and net calorific value, while 8 labs reported results related to the ash content.
- The number of reported results related to the elementary analysis is too low for an evaluation.

Results

Parameter	Spiked level [mg/kg DM]	Assigned value [mg/kg DM]	Total number of results	Comparability criterion: no. of participants, with $ z\text{-score} \leq 2$	Trueness criterion: no. of participants with results within 70-120 % recovery of the spiked level
PCB 28	0.13	0.119	12	8	7
PCB 101	0.46	0.408	12	9	7
PCB 138	0.74	0.755	12	9	6
PCB 153	0.67	0.707	12	10	7
PCB 180	0.31	0.352	12	9	7
Sum of PCBs	2.3	2.34	12	9	7
PCP	-	0.902	12	8	Not applicable
As	-	3.02	11	10	Not applicable
Cd	-	0.414	11	11	Not applicable
Cr	-	50.0	11	9	Not applicable
Cu	-	22.5	11	11	Not applicable
Pb	-	21.0	11	10	Not applicable
Hg	0.39*	0.403	12	11	9
F	75	79.0	11	7	6
Cl	-	689	11	6	Not applicable

* Target value (spiked level 0.32 mg/kg DM + 0.070 mg/kg DM contamination of the blank material).

Parameter	Unit	Assigned value	Total number of results	Comparability criterion: no. of participants, with $ z\text{-score} \leq 2$
Moisture content	% w/w	5.92	13	5
Ash content	% w/w	2.79	8	4
Gross calorific value	MJ/kg	18.3	7	6
Net calorific value	MJ/kg	16.7	7	6