

## Test method CHI-PTS-C6/2.0

### Evaluation of the disintegration behaviour of fibre-based packaging samples

Version 2.0 / 25 November 2022

This CHI test method was developed by cyclos-HTP for the evaluation of the disintegration behaviour of fibre-based packaging samples and includes the following steps (Principle of the test method is shown in the flow chart in the appendix):

#### 1. Materials and Equipment

- Sample amount: 0.75 kg dry
- Tap water: 14.2 l
- Start water temperature: 40°C
- Material fed into the Lab-Pulper feeding within 2 min at 750 rpm
- Rotor speed: 1500 rpm
- Solid content of suspension: 50 g/l
- Sampling intervals: 5 min

#### 2. Test procedure

The practical evaluation of the disintegration behaviour and disturbing potentials of packaging paper, cardboard and packaging according to this method is following this procedure:

- 1) The packaging sample is cut into square pieces
- 2) Disintegration in a pulper, sampling after 5, 10 and 15 minutes
- 3) Screening and washing on a 5 mm screen
  - a. Determination of solids content in the process water via paper filter
- 4) Disintegration behaviour on a Brecht-Holl-Fractionator (0.7 mm screen)
  - a. Determination of the total reject
  - b. Preparation of hand sheets
  - c. Sheet adhesion test
  - d. Visual inspection
- 5) Disintegration behaviour on a Haindl-Fractionator (0.15 mm screen) with defined disintegration time according to the reference recycling process for the packaging material
  - a. Determination of the reject rate
  - b. Preparation of hand sheets
  - c. Sheet adhesion test
  - d. Visual inspection

#### 3. Estimation of large-scale particles (paper, plastic) reject rate by screening and washing - coarse screening (vibration screen)

Procedure:

- 1) Stock sample to be taken out of the pulper after disintegration time
- 2) Stock sample to be filled up to 25 litres and transfer into a vibration screen
- 3) Washing and screening for 5 min with a Ø 5 mm hole plate
- 4) Manual take out of the screened large-scale pieces and drying for 24 hours at 75 °C ; weigh of the dried pieces



- 5) The remaining sample (suspension without large scale paper pieces) was fractionated (BRECHT/HOLL) - Fractionation according to PTS- method PTS-RH:021/97

#### 4. BRECHT/HOLL - Fractionation | Equipment according to ZELLCHEMING instructions V/18/62

- Screening element: Hole plate
- Hole  $\varnothing$ : 0.7 mm
- Number of holes: 870
- Distance between holes: 5.0 mm
- Sample mass (bdm): 2.0 g
- Suspension volume: 0.8 dm<sup>3</sup>
- Filling time: 0.5 min
- Total wash- and filling time: 5.0 min
- Water pressure: 30 kPa
- Membrane oscillation: 6.0 mm

#### 5. Haindl – Fractionation | Set parameters and equipment according to ZELLCHEMING instructions V/1.4/86 and PTS- method PTS-RH:021/97

- Screening element : Slotted plate
- Size of the slots: 0.15 mm
- Sample mass (oven-dry material): 5.0 g
- Suspension volume: 2.0 l
- Filling time: 15 s
- Total time: 2.0 min
- Double strokes: 200 min<sup>-1</sup>
- Water feed by bunching nozzle: 7.5 l/min
- Membrane oscillation: 18 mm

#### 6. Sheet adhesion test according to PTS-RH:021/97 “Assessment of the recyclability of packaging products made of paper and board”

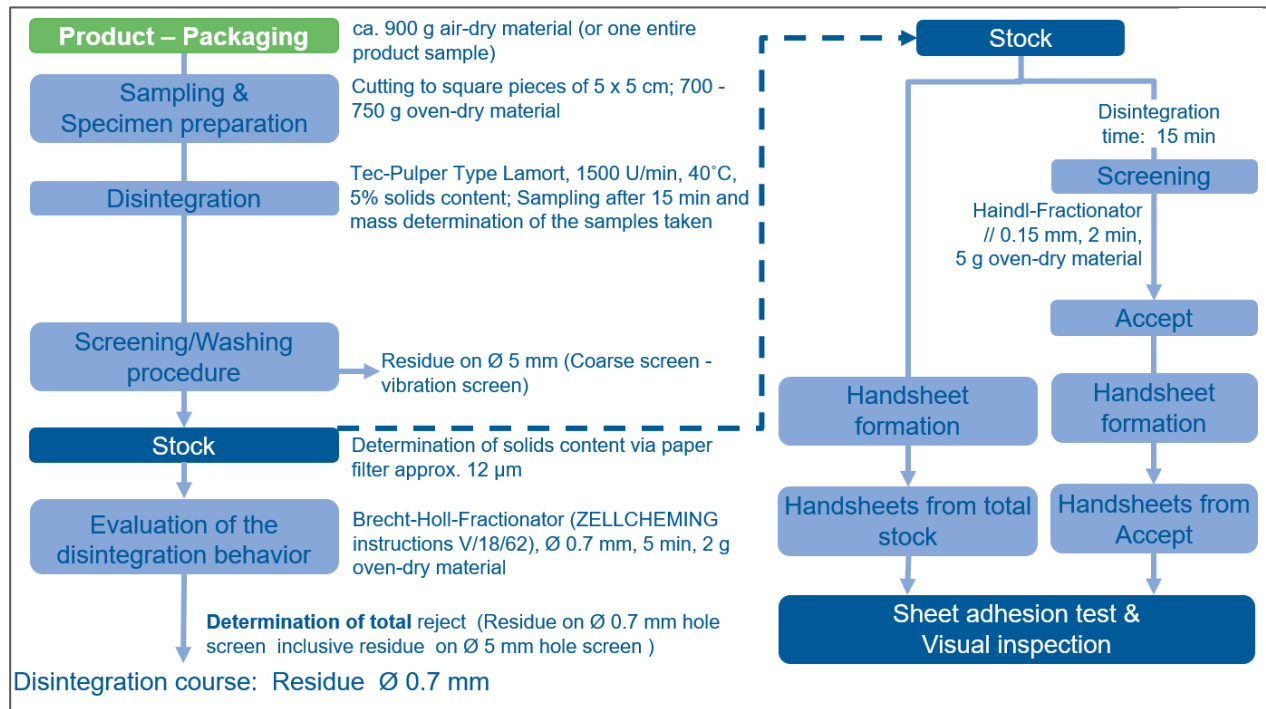
For the sheet adhesion test:

- 1) The dried hand sheets together with a couch carrier board and a cover sheet are sandwiched between two brass plates and placed in a drying oven where a full-surface pressure of 1.18 kPa is applied for 2 minutes.
- 2) Next, the specimens are placed in an exicator where they are allowed to cool down for 10 minutes, then they undergo the sheet adhesion test and the visual inspection for any optical inhomogeneities.
- 3) The carrier board and the cover sheet are one by one and slowly peeled off the hand sheets. While doing so, the test operator checks for potential adhesion effects. Also, the surfaces of the hand sheet, cover sheet and carrier board are inspected for any damage or adhesions to the hand sheet.



**APPENDIX**

**Principle of the test method:**



**Version history:**

Version No.	Date	Reason/Content of revision
1.0	Aug 2019	First version of test method
2.0	May 2022	Updated test procedure, including determination of solids in the process water