REPORT

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Disintegration of a polypropylene-based plastic film under simulated composting conditions

Commission

To determine the degree of disintegration of a plastic film under simulated composting conditions in laboratory scale.

Test object:

Plastic film consisting of polypropylene (PP) with 6 % of the additive HE. The film was designated test film nr. 6.

Period of testing: Mars –September 2005

Methods

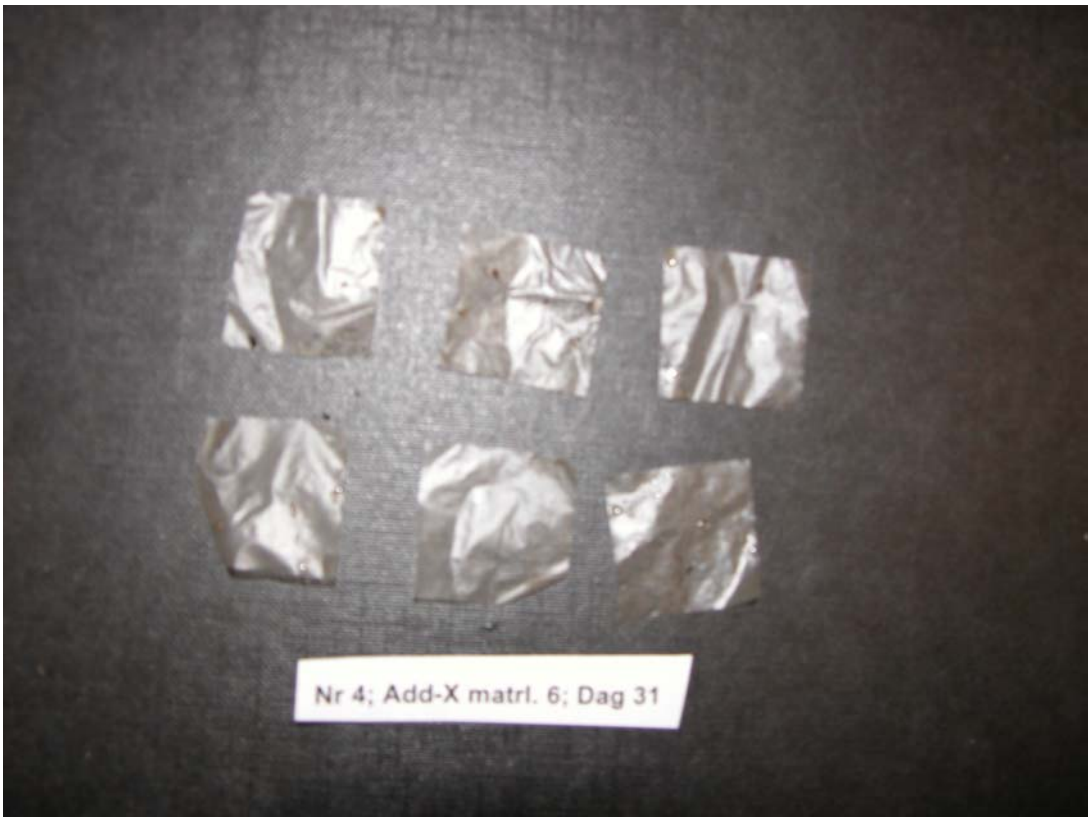
The thickness of the test material was measured with a Mitutoyo thickness measurer on 10 randomly picked test pieces and was determine to be 30,5 ± 2,3 µm.

The disintegration test was performed according to the standard ISO 20200 with one exception comprising the amount of the test material.

According to the standard, between 5 and 20 g should be added to 1 kg compost. Consequently, about 6 g of the test material was added to each vessel in the first round of the tests. However, the variation in test results of degree of disintegration between parallel samples was too large. Therefore, the disintegration test with the material was repeated during spring 2005 using 1,2 g of the test material.

Three parallel composting vessels (desiccators) were used during the test. Each vessel contained 1000 g (wet weight) of a microbiologically active synthetic waste consisting of sawdust, rabbit-feed, ripe compost, corn starch, saccharose, corn seed oil and urea. The vessels were placed at 58 ± 2 °C for 90 days and then at 23 ± 2 °C for the remaining of the test period. In total the test period was 181 days. pH was 5,7 at the start of the test and on average 6,0 after the test.

The degree of disintegration, measured as the percentage of the amount of the test material at the start of the test that had disintegrated to less than 2 mm sized fragments at the end of the test, was > 90 %. The results from the disintegration test fulfil the requirements in the standard.



Picture 1. Test pieces of the material after 31 days of the thermophilic period in the compost.

Picture 2. Test pieces of the material after 71 days of the thermophilic incubation period in the compost. The material is brittle and bears traces of disintegration.

Picture 3. Compost containing test material after 90 days of thermophilic incubation period followed by 91 days of mesophilic incubation period. It is not possible to discern the test material except some small pieces in a very few cases.

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