

REPORT

DigiTech Rental AB
Rune Höglund
Box 74
870 10 Älandsbro

Handläggare, enhet / *Handled by, department*
Susanne Ekendahl, Chemistry and
Materials Technology
+46 33 16 53 16, susanne.ekendahl@sp.se

Datum / *Date* Beteckning / *Reference* Sida / *Page*
2004-01-14 F322938 B 1 (5)

Test of the ability of FAP-cassettes to reduce mould growth in a refrigerator (2 appendices)

Commissioner

DigiTech Rental AB, Älandsbro, Sweden.

Test material

Bags with combined materials of FAP-adsorbents (minerals). Designated "Mirakelkassetten®, *Fridge*".

Arrived

2003-11-10

Commission

To test if the product, due to its' moisture adsorbing capabilities, has any influence on mould growth on food in a refrigerator environment.

Dates of testing

2003-11-25 – 2003-12-17

Testing methods

A test was performed in a refrigerator. Mould growth was determined as visual growth on fresh fruit in containers with and without the adsorbent. No mould growth was visible from the start.

Double samples were performed in 6 l glass bottles. Temperature was measured continually in two bottles, one with cassette and one without. In the other two, temperature and moisture was measured with a hand tool 2-5 times per day, when the bottles were also opened. The containers were each supplied with 1/8 orange, ¼ apple and ¼ orange rinsed in 70 % ethanol. The test duration was 22 days.

Test results

The temperature was around 5-8°C in the refrigerator. There was a lot of condensate in bottles without cassettes, while there were none or after 8 days only a little with cassettes. The cassettes had then adsorbed 6,7 and 7,2 % moisture of their original weight. After 21 days it was 9,3 and 9,4 %. The temperature in bottles with cassettes was constantly 0,5-1,5°C lower than without them. This temperature drop was not due to the position in the fridge or the measuring device (position changes had no effect). The moisture was during the first 2 days significantly lower than in bottles without cassettes (67-80 % compared to 90-95% RH). This was slowly evened out and after 8 days the situation was reversed, so that the moisture in cassette containing bottles were 93-94 % while those without were 90-91 %. The temperature drop however remained.

Mould began to show in the containers without cassettes after 13 days, while it did not show until after 20 days in bottles with cassettes. In this test a clear effect of the cassettes on mould growth could be seen (see pictures 1-4 in appendix 1). After 20 days mould could be seen on the two ethanol-rinsed oranges, one in a bottle with cassette and one in a bottle without cassette. It was more on the one without cassette.

Summary and comments

The FAP-cassettes have been shown to have a clear negative effect on mould growth on fresh fruit in a cold refrigerator environment; i. e. the growth was delayed for one week. Clear effects could also be seen on the forming of condensate, temperature and at first on moisture.

Very generally, both mould and bacteria grow slower at cold temperatures and at least mould also grows slower at less moisture levels (at least when < 70 %).

**SP Swedish National testing and Research Institute
Polymer Technology**

Technical Manager
Ignacy Jakubowicz

Technical Officer
Susanne Ekendahl

Appendices:

1. Pictures (3 pages) from the refrigerator test after 20 days. Pic. 1-2: from bottle without cassette, pic. 3-4: from bottle with cassette, pic. 5: refrigerator test
2. Temperature curves from refrigerator test. Channel 221: bottle without cassette, channel 222: bottle with cassette. Peaks depend on fridge openings.

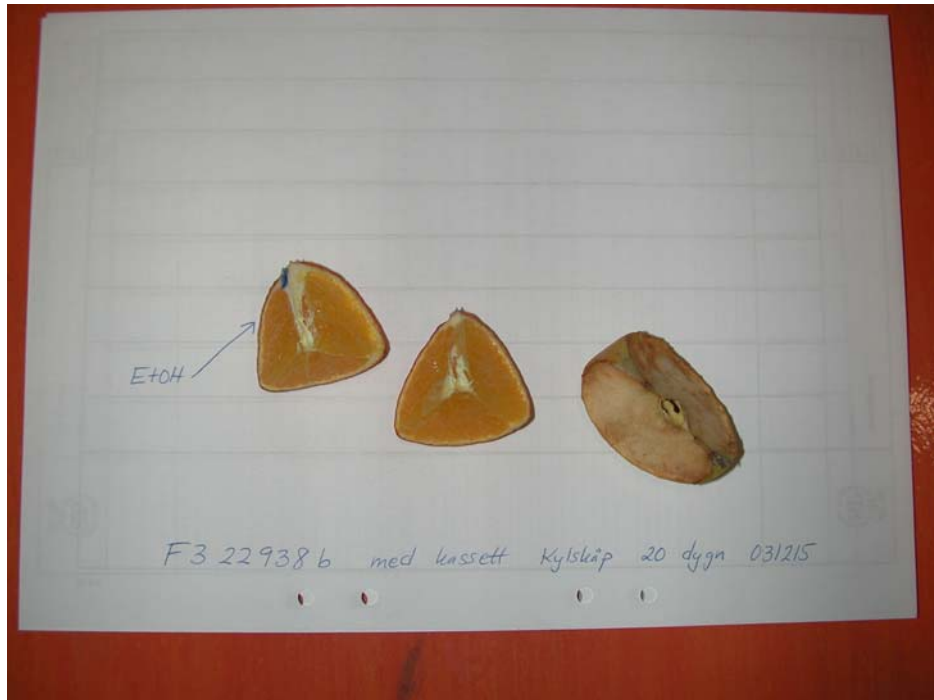
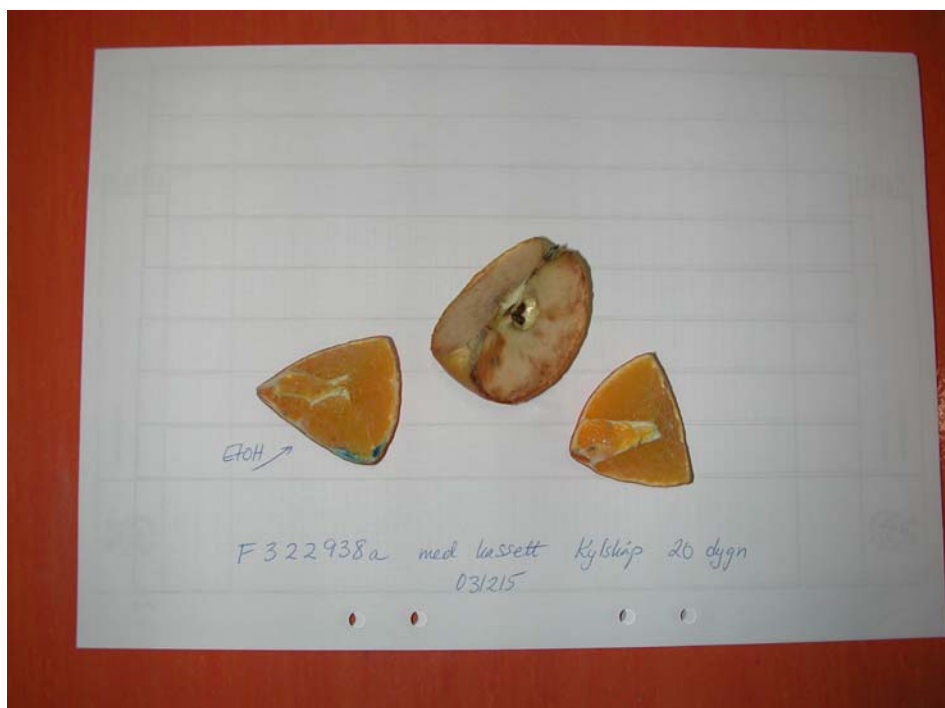
APPENDIX 1. Refrigerator test.

Picture 1. Without cassette.



Picture 2. Without cassette.



Appendix 1, continued.**Picture 3. With cassette.****Picture 4. With cassette.**

Appendix 1, continued.

Picture 5. Test bottles with and without cassettes in the refrigerator.

