

Develop a post-market test for recycled food contact materials

Area of research interest: [Chemical hazards in food and feed](#)

Study duration: 2011-03-01

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Conducted by: Rapra Technology Limited

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Background

There is increasing pressure on businesses and consumers to recycle waste materials. There is also increasing pressure to use recycled materials in place of virgin materials or as a percentage component in a mixed virgin/recycled end product.

Reflecting the interest in recycled packaging, EU legislation has been introduced on recycled plastic materials and articles intended to come into contact with foods. Although 'challenge tests' exist to ensure that a product is of an appropriate standard if manufactured correctly, enforcement is by means of factory visits in the country of production to ensure that the authorisation criteria are being met. In addition, while there is no specific legislation covering paper and board, these materials must meet the general requirements of the Regulation (EC) No 1935/2004.

Test methods should be in place to ensure that consumers are protected from contamination from poorly recycled food contact materials. It is practically impossible to test recycled materials for the thousands of pollutants that may be present, if the recycling process has not been carried out properly.

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Research Approach

The purpose of this project was to gain knowledge of typical substances that would always be present in plastic and paper and board materials before they are recycled as a result of their first use, but which should be effectively removed by recycling. Once these chemical substances were identified and methods for their analysis developed, then materials, articles or packed food, could be tested for these substances. This test aimed to verify that the recycling process had been properly carried out and in effect would be a post-market 'challenge test'. The aim was to help determine whether consumers are adequately protected from substances which may end up in the materials, articles or packed food.

A review of published and unpublished (where available) information on the chemical compounds that represent first use conditions for recycled polyethylene (PET), and paper and board were carried out. Analytical methods were then established for the identification and quantification of selected marker compounds.

The selected marker compounds were then analysed in recycled PET plastic, and paper and board materials and products. Migration experiments were then carried-out on a limited number of PET, and paper and board products in a range of food simulants.

The purpose of these experiments were to verify the methods of analysis developed earlier in the work and measure for the presence of the marker compounds in samples of recycled PET, and paper and board. Food simulants were used in the laboratory to provide a conservative estimate of the amount of individual substances that may migrate from packaging into food.

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Results

This project was successful in identifying nine marker compounds (contaminants) which could be used to indicate if a poor, or defective, recycling process has been used to generate recycled material intended for the manufacture of recycled food contact products.

These marker compounds can now be used by industry as part of their good manufacturing process (GMP) of their recycling process (which the European Food Safety Authority is currently approving).

They could also be used to monitor the quality of recycled products (eg bottles) and to assist in the enforcement of the appropriate legislation.

Research report

England, Northern Ireland and Wales

PDF

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