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# PVC SHEET AND THERMOFORMED ARTICLES

Packaging and Industrial Films Association

## MIGRATION TESTING

### Background

EC Directive 90/128/EEC applies to plastic materials and articles intended to come into contact with foods. The Directive includes an overall migration limit, which applies to the finished article, which must be tested to demonstrate compliance with the legislation. However, the Directive makes provision for demonstrating compliance by conducting a 'more severe test'.

Overall migration testing with the fat simulant olive oil is time consuming and complex involving determination of absorbed olive oil by derivatization and gas chromatography. Where a wide range of different finished articles are produced from the same starting sheet, as in the thermoforming process, the cost of testing each individual item would be prohibitive.

### Migration Tests

A range of PVC articles and extruded or calendered sheets, from which the articles were formed, was submitted for overall migration testing by PIRA. The PVC samples tested represent a typical range of unplasticised formulations used in the plastics packaging industry. All of the work was conducted using the fat simulant olive oil and the test conditions 10 days at 40°C.

In this study the results were obtained by total immersion and only the surface area of one side of the specimens was used in the calculation; ie. it is expected that the results for the finished articles would be lower, if the tests had been conducted by exposure of only the food contact surface.

The determination of overall migration values was conducted according to the ENV Standard 1186 part 2.

The overall migration results obtained were all extremely low at <math><2\text{mg}/\text{dm}^2</math> with the values for the PVC sheets being higher or equal to the formed articles.

The results confirm previous data with olive oil overall migration testing of PVC articles and can be considered to be a more 'severe case'.

### Conclusion

**It is concluded that for the purposes of compliance with EC Directive 90/128/EEC**

1. The overall migration values obtained using olive oil and the test conditions 10 days at 40°C with the extruded and calendered PVC sheets are the same or higher than the results obtained on the thermoformed articles.
2. Testing of the sheet by total immersion can be considered to be a 'more severe test' where the result is calculated from the surface area of one side of the specimen.
3. That the work carried out has provided sufficient experimental data to support testing of the starting PVC sheet instead of the formed articles by considering the former as a more 'severe test' as provided for in the Directive Annex 1, Section 3.

Ref: PIFA/MIG 1