

For those who have not yet worked with migration model, the following is an attempt to describe the modelling approach of migration with simple words, avoiding the complex mathematics behind it.

Migration Modelling is a mathematical approach to calculate migration (= transfer of a substance) from one phase into another phase: from plastics into food simulant or food. The general approach is based on the parameters which influence the speed of the migration between the two phases:

- 1) The intrinsic properties of the polymer (e.g. density) which influence the speed of movement of a substance in the polymer
- 2) The properties of the substance, e.g. the molecular weight and size of the molecule
- 3) Parameters which influence physical and chemical behavior of substances in general and specifically for this approach, e.g. temperature, gas constant, time of contact, contact area
- 4) Physicochemical parameters which influence / describe (in numbers) the speed of movement of the molecules:
 - Diffusion coefficient: describes the movement in the polymer
 - Partition coefficient: describes the transfer from the polymer into the food simulant (or food)

The figures generated for these parameters to establish / run the model are part of the migration modelling equation, which then “solves” the migration process mathematically.

It has turned out that for each polymer there are typically polymer specific values which need to be established by experiment before the model can be applied. For a lot of parameters this was done in the past and the parameters are available in the modelling solutions provided. Most triggering parameters for calculation of the migration of an individual substance with current available software based modelling solutions are molecular size (molecular weight) and temperature, see also below in more detail.