

Fundamentals of Packaging Permeation

About the Seminar:

Appropriate resistance to permeation is critical for product protection from environmental conditions that can increase field returns, shorten shelf life, and hasten spoilage. Designed for personnel who design packages and products, the Fundamentals of Packaging Permeation one day training course provides a fundamental understanding of the nature of permeation in flexible, semi-rigid and rigid packaging systems for foods, pharmaceuticals and other packaged goods. The comprehensive course covers material from the foundations of mass transfer (Fick's Laws) to practical prediction of multilayer transmission rates.

Who Should Attend:

The seminar is recommended for professionals in R&D, testing, process, design, fabrication and manufacturing of food, pharmaceutical, medical, cosmetic, chemical, veterinary or industrial product packaging. Packaging, film and foil personnel who require an understanding of permeation as it relates to their products will also benefit from this comprehensive training course.

Benefits of Attending

- ▶ Learn the fundamental basis for permeation
- ▶ Understand how physics and chemistry apply to permeation
- ▶ Ascertain how to convert transmission rates to P and vice versa
- ▶ Determine how to predict permeation at elevated temperatures
- ▶ Predict permeation of multi component packages
- ▶ View permeation through technical data, graphs and formulas

Concepts Covered

- ▶ Fick's Laws of Diffusion
- ▶ Materials science of barrier materials
- ▶ Transmission rates
- ▶ Tortuous path
- ▶ Barrier of glass, metal and polymers
- ▶ Temperature effects on permeation



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Course Syllabus

- ▶ Introduction
- ▶ Driving force for permeation
- ▶ Mass transfer with no membrane
- ▶ Mass transfer through a membrane
- ▶ Transport properties: Momentum, heat and mass
- ▶ Steady state permeation
- ▶ Unsteady state permeation
- ▶ Fick's law and Henry's law
- ▶ Flux, permeance and transmission rates
- ▶ Materials science of permeation
- ▶ Common packaging barrier materials
- ▶ Tortuous path
- ▶ Multi-layer permeation
- ▶ Permeation in multi-component packages
- ▶ Foil, metallization and pinholes
- ▶ Permeation through package seals
- ▶ Accounting for standard temperature and pressure
- ▶ Temperature dependence of permeation
- ▶ Humidity dependence of hygroscopic materials
- ▶ Tactics of barrier measurement
- ▶ Measurement of water vapor permeation
- ▶ Measurement of oxygen permeation
- ▶ Measurement of aroma permeation