

A. Barrier principles

This first sub-section identifies and examines key principles that control barrier performance of some materials. Critical variables include temperature, humidity, and barrier material thickness. We will find later in the study, when we examine the barrier performance of the individual barrier materials used for rigid packaging, that the individual barrier materials vary greatly in barrier performance. Materials such as aluminum sheet, glass, and steel sheet provide excellent barrier performance regardless of the environmental conditions. In contrast, the barrier performance of barrier polymers such as EVOH resin and nylon resin depends heavily on environmental conditions.

1. Temperature dependence

Temperature can have a strong impact on barrier performance. For example, Figure 9 illustrates the impact of temperature on oxygen permeation for ethylene vinyl alcohol (EVOH) resin.

