

## Properties of PBS

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### Breathing properties

**The permeability analysis permitted to measure the CO<sub>2</sub> transfer and its selectivity compared to oxygen.** A factor 7 was observed from the lowest CO<sub>2</sub> permeability of PBAT and the CO<sub>2</sub> permeability of Talc filled PBS. The ratio between CO<sub>2</sub> and O<sub>2</sub> permeability (also called the selectivity) varies from 10 for PBAT to 14 for PBS and PBS compounds. These values are higher than the common reported values in literature for classical packaging materials (from 3 to 6). This high selectivity of all PBS based materials is of a great interest for the packaging of fresh food products which are better preserved in conditions of slow oxygen penetration and fast CO<sub>2</sub> release.

Materials that present selectivity for the CO<sub>2</sub> permeability are especially useful for packaging products that generate CO<sub>2</sub> during their storage, like ripened cheese, or fresh vegetables, among others. In particular, fresh vegetables continue breathing during their storage. Thus, in order to extend their shelf-life it is necessary to reduce the breathing rate of the product for reducing its biochemical activity, which implies to select the proper modified atmosphere, and film for the packaging.

**For the practical tests fresh-cut lettuce has been selected as product, and compared to the commercial packaging film with 3 kinds of PBS based films:** PBS (20 µm), PBS (30 µm) and a PBSA/PBS film. For the comparison tests, microbiological parameters selected were *Listeria* spp. and the level of mesophilic aerobic microorganisms.

The results showed that the level of *Listeria* spp. remained the same for samples packed with the commercial film and with all the PBS based films. Concerning the level of mesophilic aerobic bacteria the tests showed, in general, a lower level of microorganisms for the products packed with the PBS based materials.