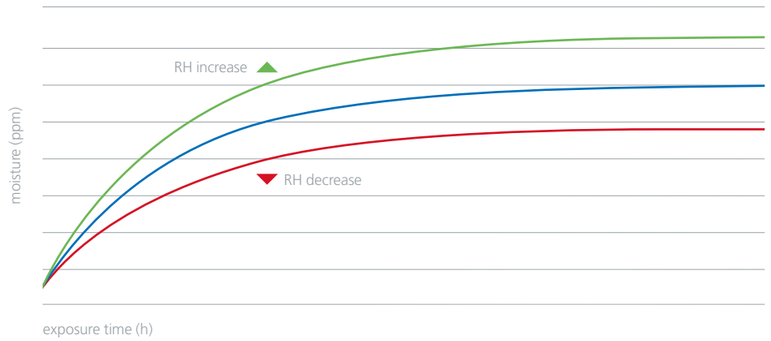
INFLUENCE OF HUMIDITY ON PET

and consequences for sheet and tray production

PET is a hygroscopic material. Therefore, the absorbed moisture causes significant property deterioration, such as a decrease of tensile strength or a reduced useful life time. Prolonged storage can lead to hydrolysis. Previous studies found that moisture causes rapid hydrolytic degradation which results in a major reduction of the polymer molecular weight. A vast amount of customers store their materials in big bags for a certain amount of time. The following findings show the relationship of absorbed water, exposure time, and relative humidity conditions in a warehouse. The figure below indicates the moisture absorption of post-industrial regrind (PIR) PET materials, stored at various relative humidity conditions as a function of exposure time. After relatively fast moisture absorption at the beginning of the measurements a plateau can be observed after some time due to an equilibrium state. Moreover, an increase of moisture content with increasing relative humidity and vice versa can be observed.

Findings

- After a certain time the data approaches a plateau
- The higher the relative humidity, the higher moisture uptake

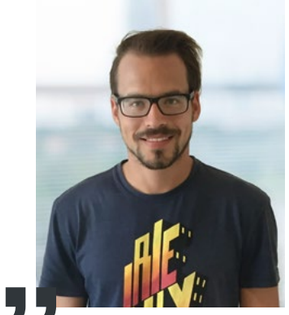


Procedures to minimize storage time for post-industrial-regrind (PIR) PET materials:

- Direct edge trim recirculation
- Immediate grinding and reuse of skeletons/production scrap (within few hours)
- In-house storage at controlled ambient conditions of PIR

Positive impacts on processing of PET:

- Shorter drying times
- Less energy consumption for drying
- Increased usage of undried material
- Higher viscosity (iV) in final product



"viscotec stands for circular economy and pioneering recycling solutions and I am proud to be part of this family. It is important for all people on this planet to think about waste management. Plastic, especially PET is a great material due to its range of benefits, but we as human beings have to rethink our behavior and implement the 4R (Refuse, Reduce, Reuse and Recycle) principle in our everyday life.

MICHAEL ECKERSTORFER
PRODUCT MANAGER
VISCOTEC