

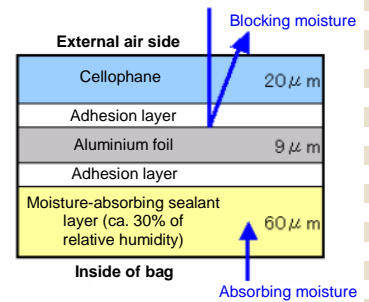
Moisture-absorbing film packaging material

Toyol Dry



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Example of composition 1

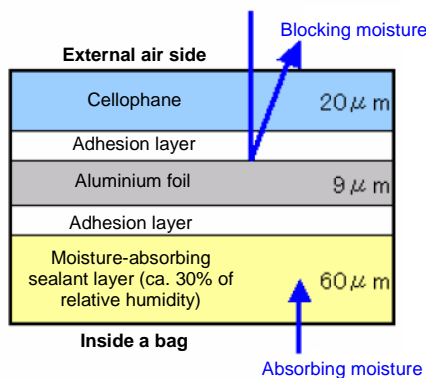


【 1. Introduction 】

Toyol Dry is a film packaging material that is basically composed of base film/aluminium foil/moisture-absorbing layer. The surface material of the base film and aluminium foil layers prevents absorbing moisture from the air outside. The moisture in the bag is adsorbed by a moisture-absorbing PE layer (which conforms to the Notification No. 370 of the Ministry of Health and Welfare), in which a hygroscopic resin is kneaded.

The moisture-absorbing layer features moisture absorption performance with hygroscopic inorganic fillers kneaded in PE, where the pickup of moisture can be controlled by the filler content (film thickness). Because this moisture-absorbing function is irreversible, moisture once absorbed is not be released into the air. The material takes up the moisture to a specified saturation point and, under certain humidity conditions, it stops absorption. Due to this humidity control action, the material is suitable for packaging tablets, for example, which are easily broken under dry conditions. (Example of composition 1)

Example of composition 1

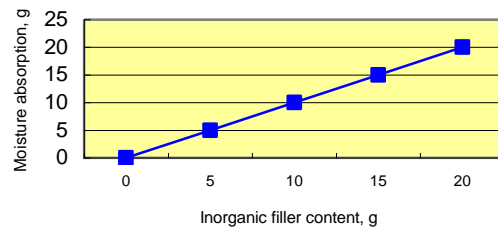


【 2.Characteristics of Toyol Dry 】

1. Relationship between content of hygroscopic inorganic fillers and moisture absorption - Fig.1

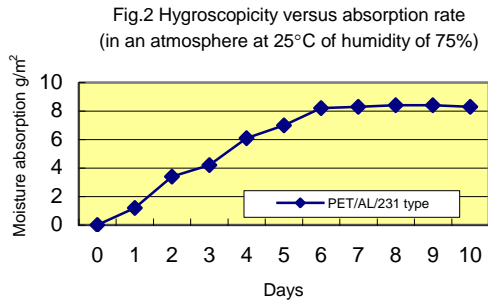
- Because moisture absorption is proportional to the amount of inorganic fillers, the level of absorption can be easily adjusted. In other words, moisture absorption can be controlled by changing thickness.

Fig.1 Inorganic filler content versus hygroscopicity

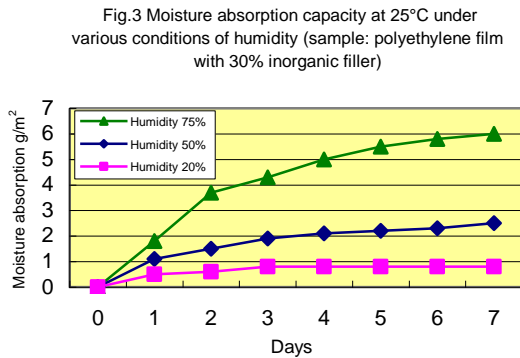


- In the lineup of hygroscopic films, four types are available: type 111 with a thickness of 40 μm (max. moisture absorption: 3 g/m²), type 231 of 60 μm (max. moisture absorption: 9 g/m²), type 141 of 60 μm (max. moisture absorption: 12 g/m²), and type 251 of 80 μm (max. moisture absorption: 15 g/m²).

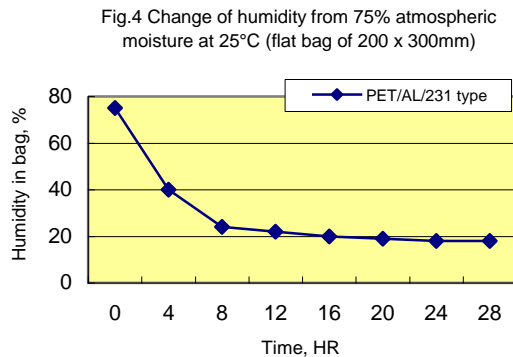
2. Relationship between saturation point and absorption rate - Fig. 2
 Relatively low absorption rate reduces degradation of performance by absorbing moisture in the lamination process.



3. Relationship between environmental moisture and hygroscopicity - Fig. 3
 The moisture absorption capacity varies as a function of environmental moisture.



4. Humidity control - Fig.4



At a certain humidity, the material stops absorbing moisture.
 It performs humidity control in a bag and brings benefits to tablets etc., which are easily broken under dry conditions.

5. Introduction of complete moisture absorption type
 If you would like to have the moisture absorbed to have a humidity of 0% in a bag, the following complete moisture absorption type is available. (Example of composition 2)
 The moisture in a bag can be gradually removed close to 0%.
 -Fig. 5

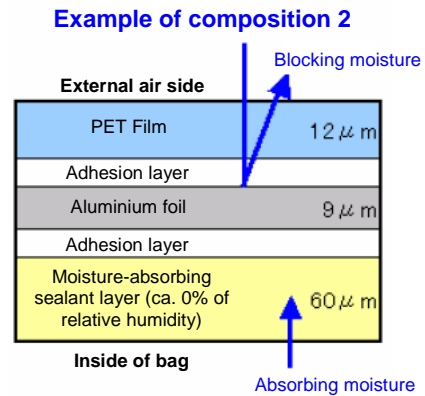
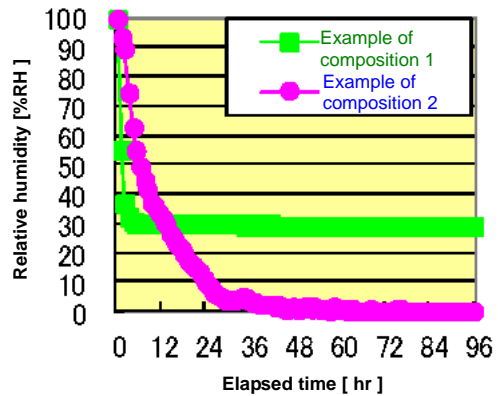


Fig. 5



Initial (0 hr): relative humidity was 100% RH (at 25°C)
 The relative humidity was measured in a sealed bag (A4 size) every other hour.

End of report