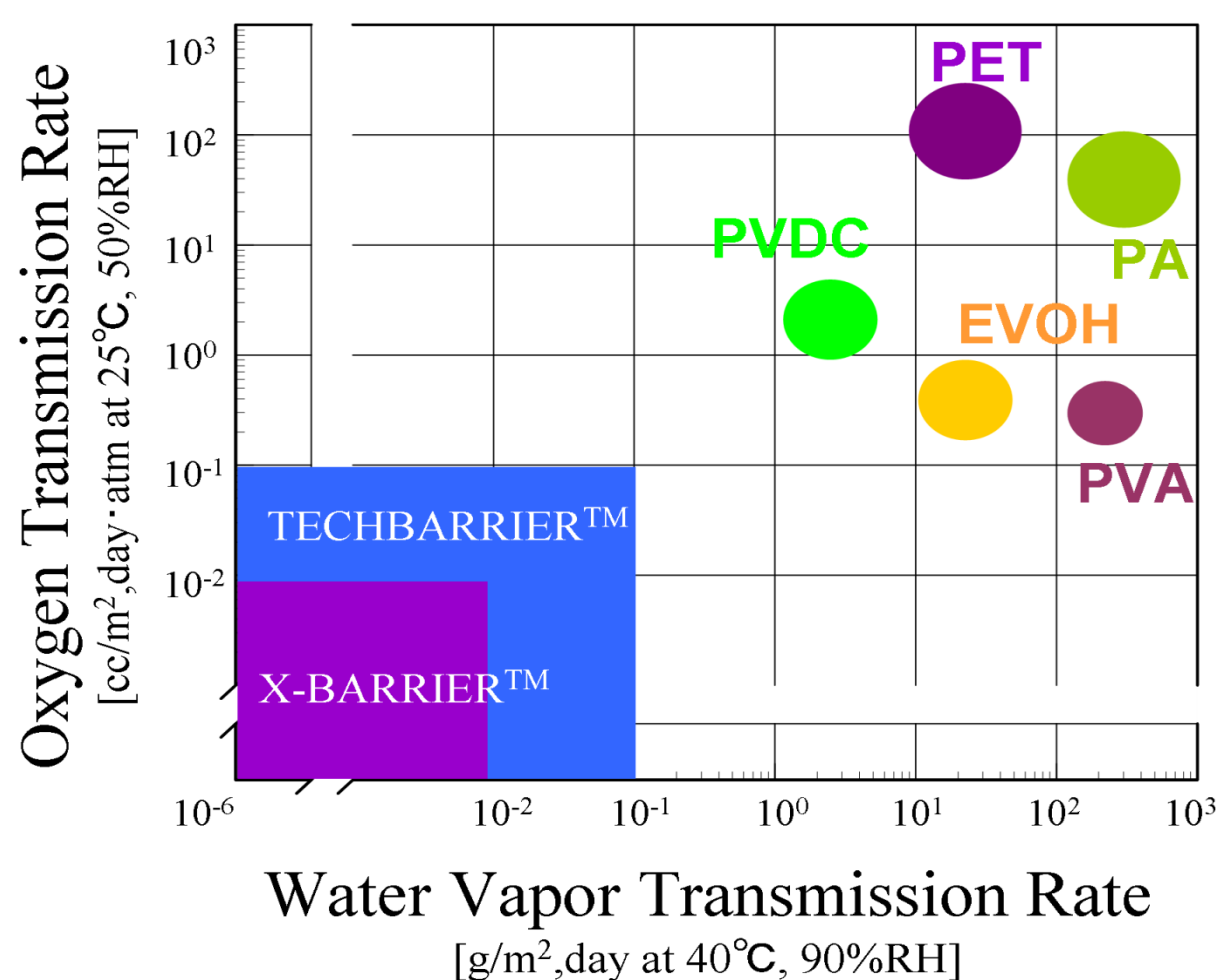


High Moisture Barrier Flexible Front Sheet for CIGS

O.Akaike, T.Aya, N.Ninomiya, Y.Mitsukura and S.Kanai
Gas Barrier Film Development Centre, Mitsubishi Plastics Inc. Japan

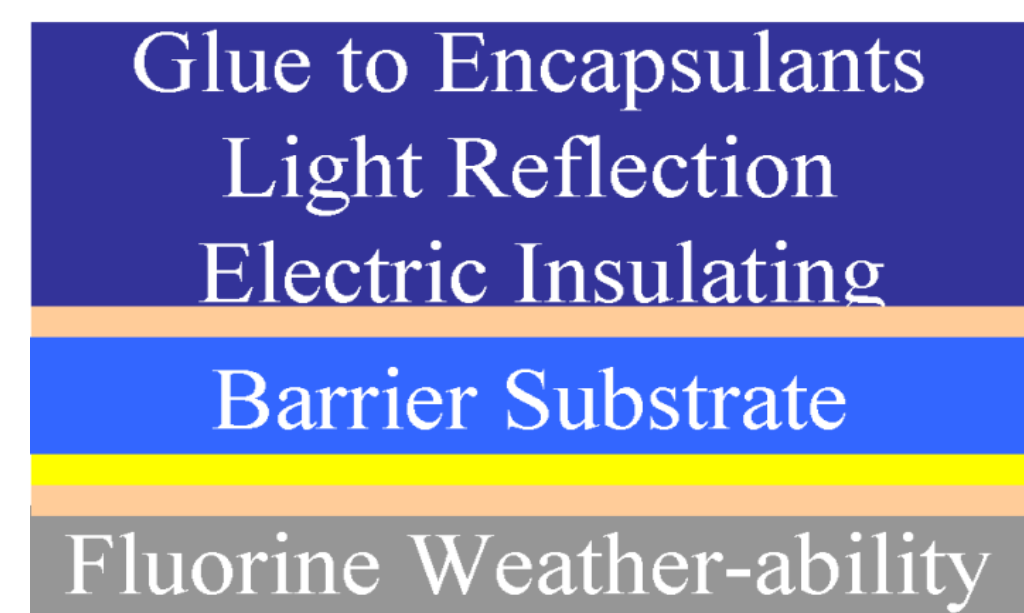


MPI established first foothold in food packaging market by transparent high gas barrier film 'TECHBARRIER™' at the beginning of '90s. MPI has been major supplier in world wide for more than 20 years.

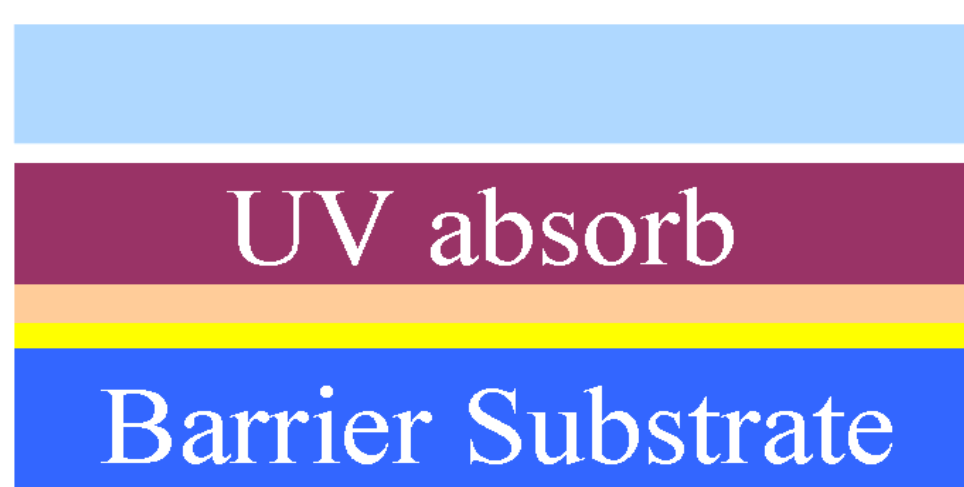
MPI launched the sales of the transparent super high barrier films 'X-BARRIER™' for the PV markets with supply reliability.

We have evaluated the 'X-BARRIER™' by several acceleration tests, damp-heat, fluorescent UV and we have found that the new developed 'X-BARRIER™', which are laminated with functional films via proper adhesives, have marked the highly durable performances through the acceleration tests.

Features of X-BARRIER™ : PV Back Sheet & Front Sheet

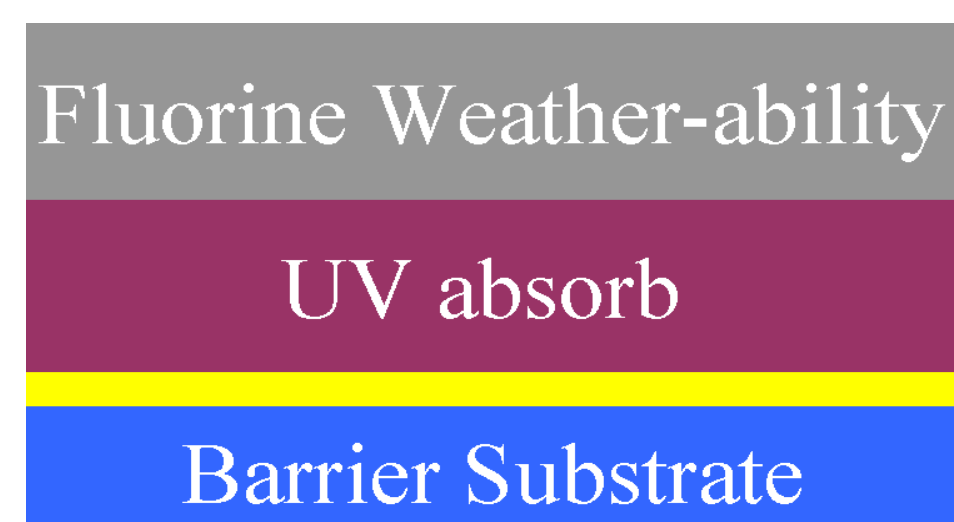


Back Sheet : Thickness : 200 to 250 micron
WVTR : 10^{-2} to 10^{-4} [$\text{g/m}^2\cdot\text{day}$] 23°C



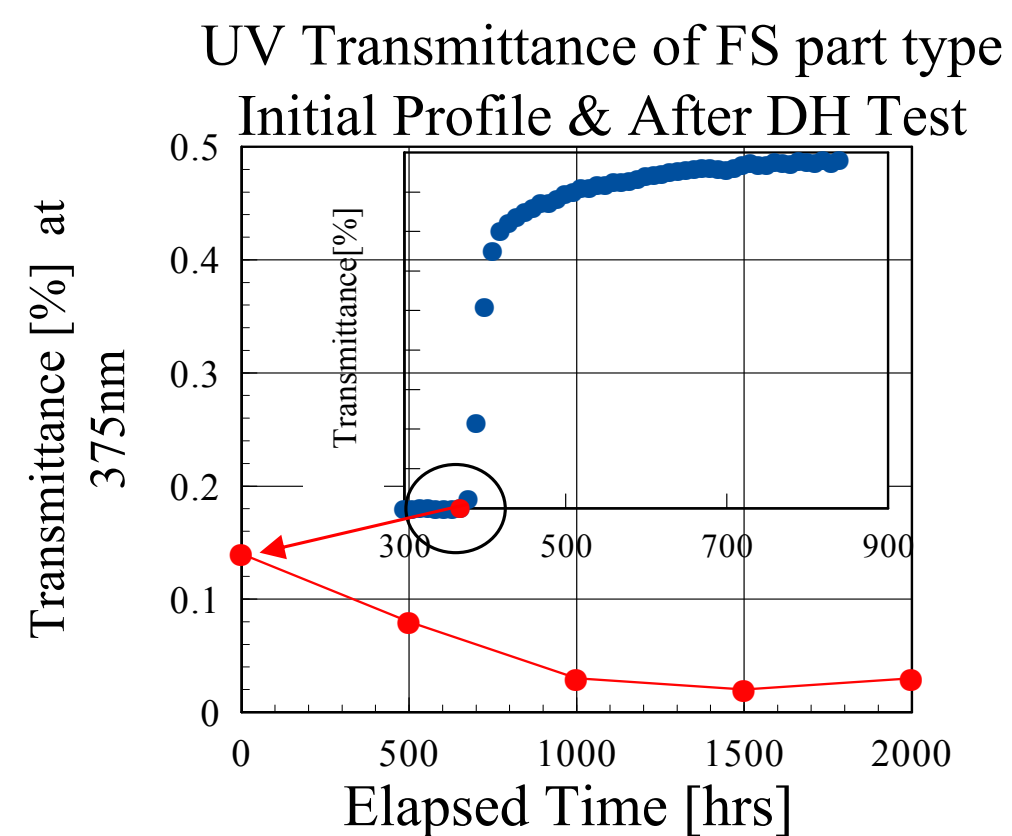
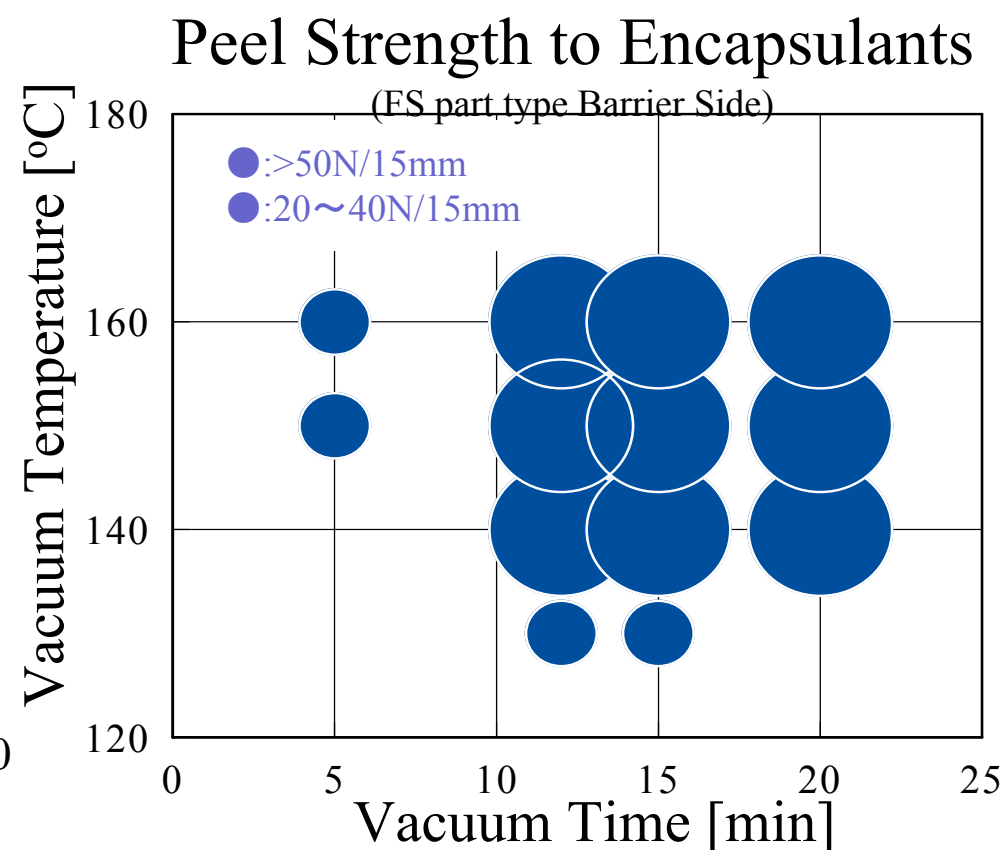
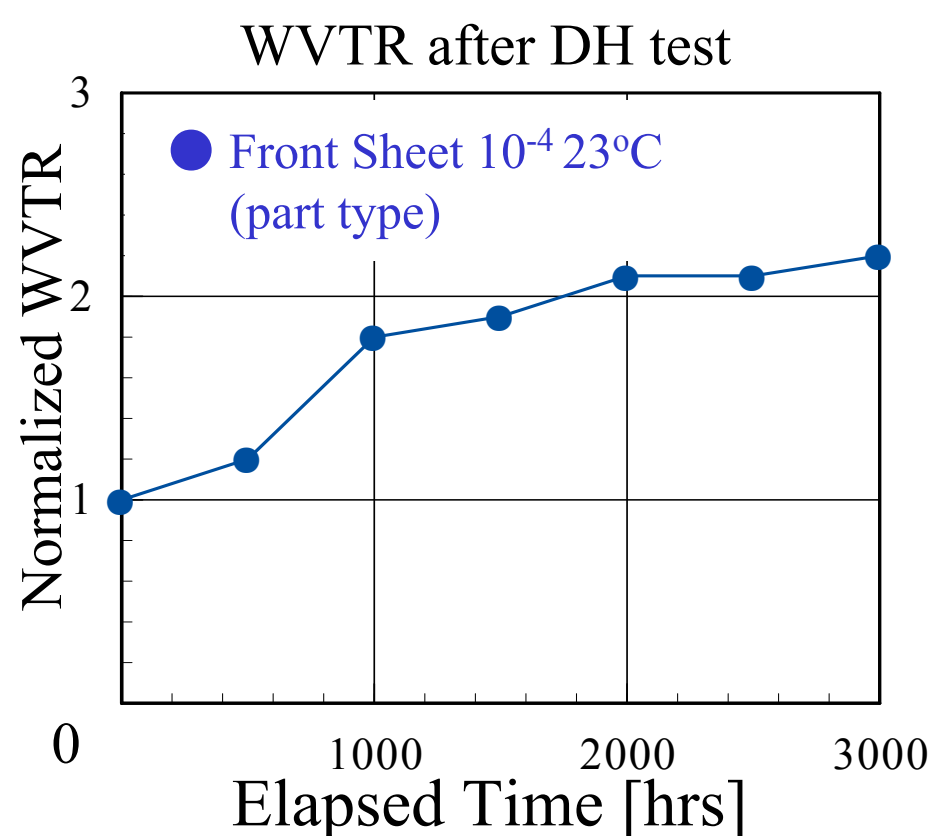
Front Sheet (Part Type)

Thickness : 75 to 150 micron
WVTR : 10^{-3} to 10^{-4} [$\text{g/m}^2\cdot\text{day}$] 23°C

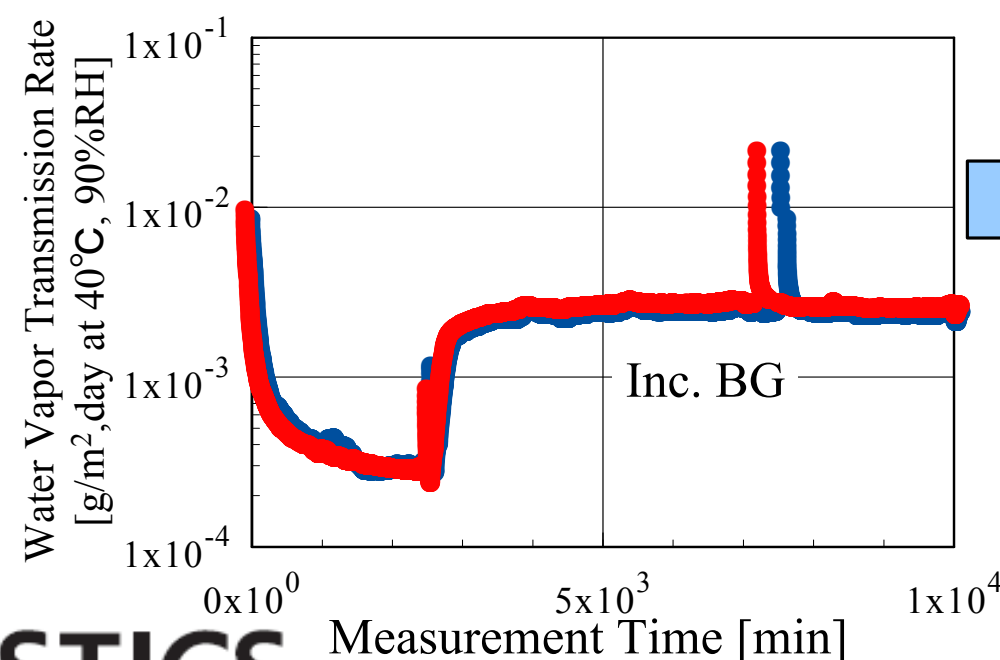
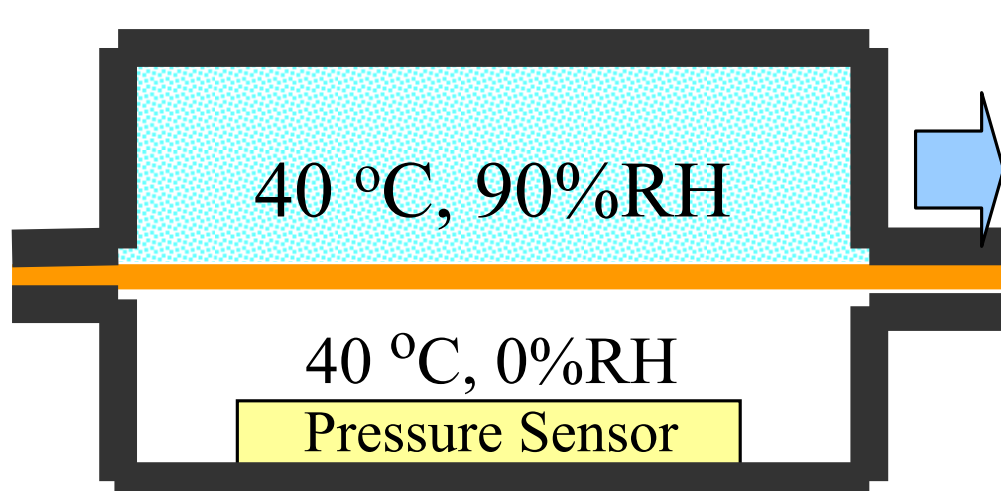


Front Sheet (Whole Type)

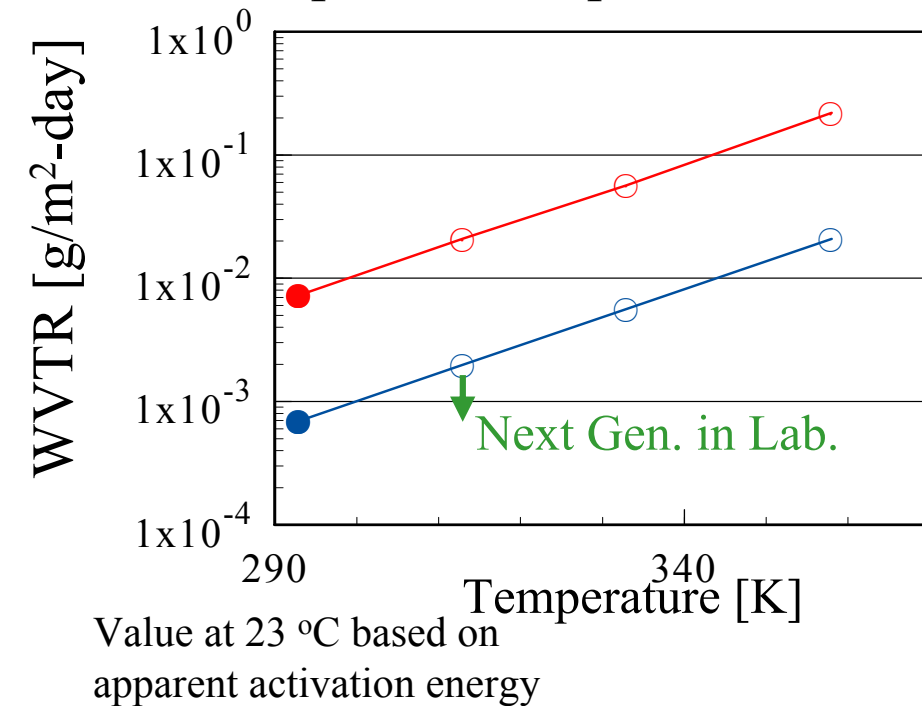
Thickness : 80 to 150 micron
WVTR : 10^{-3} to 10^{-4} [$\text{g/m}^2\cdot\text{day}$] 23°C



MPI Precise WVTR Measurements : Differential pressure method



Temperature Dependent WVTR



Value at 23°C based on apparent activation energy