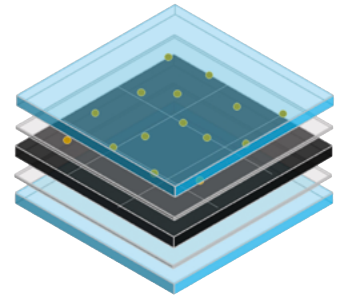


# NANO-ENABLED ENCAPSULANT

High Refractive Index Encapsulant for Photovoltaics

# The nano-enabled Encapsulant is BMCs high refractive index polymer film. The together with Yparex jointly developed film is used as encapsulant for silicon PV modules to increase solar cell efficiencies.

- Current commercially available silicon PV modules have cell efficiencies around 20%. The loss in efficiency results partly already from light reflection at the interface between glass cover – encapsulant and encapsulant – PV cell. To reduce light reflection at the interfaces and therefore increase cell efficiencies, BMC and Yparex jointly developed nano-enabled encapsulant, an encapsulant with an optimized refractive index.
- To increase the refractive index of the encapsulant, we use high refractive index pigments and integrate those into the polymer film, which is used as encapsulant.
- The encapsulant can be prepared with various pigment loadings to adjust the refractive index of the encapsulant to the desired value. This increases flexibility for application of the encapsulant in other systems.
- The high refractive index pigments are optimized in size to prevent scattering and realize low haze values. Furthermore the pigment surface is functionalized to realize perfect compatibility with the polymer. Therefore an even distribution of pigments in the encapsulant is realized without agglomeration, which is essential to realize low haze and scattering values.
- Theoretical calculations have shown that using the nano-enabled encapsulant in current silicon PV cells increases the light transmission in high wavelength regions around the bad gap of Silicon and therefore can lead to a relative increase in cell efficiency of up to 6%.



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