

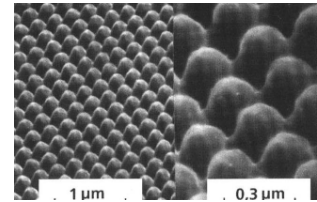
ANTIREFLECTIVE NANOSTRUCTURES

Antireflective nanostructures applied on polymer parts are an interesting alternative to conventional AR-coatings. Due to their either periodical or stochastic shape, those nanostructures function as a graded layer and thus eliminate reflexes at polymer-air interfaces.

ORAFOL Fresnel Optics GmbH has gained substantial experience in the field of replication nanostructures and now offers different structures:

Motheye-Structure (ME)

The well known motheye-structure, which is a periodical nanostructure, can be described as an optical grating. However, due to interferences, the periodicity leads to an intense angularly dependent residual reflection.

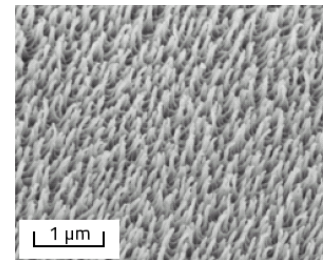


Motheye-Structure

PlasmAR® molded (MAR) and PlasmAR® direct (PAR)

The PlasmAR®-nanostructure is a stochastic structure which is characterized by an irregular arrangement as well as different heights and widths of the structure. It results from a controlled treatment of a polymer surface with ion plasma.

In order to allow for serial production in our compression molding process, there is the possibility to create a manufacturing tool by electroforming.



PlasmAR® - Structure

Comparison of Properties of AR-Nanostructures

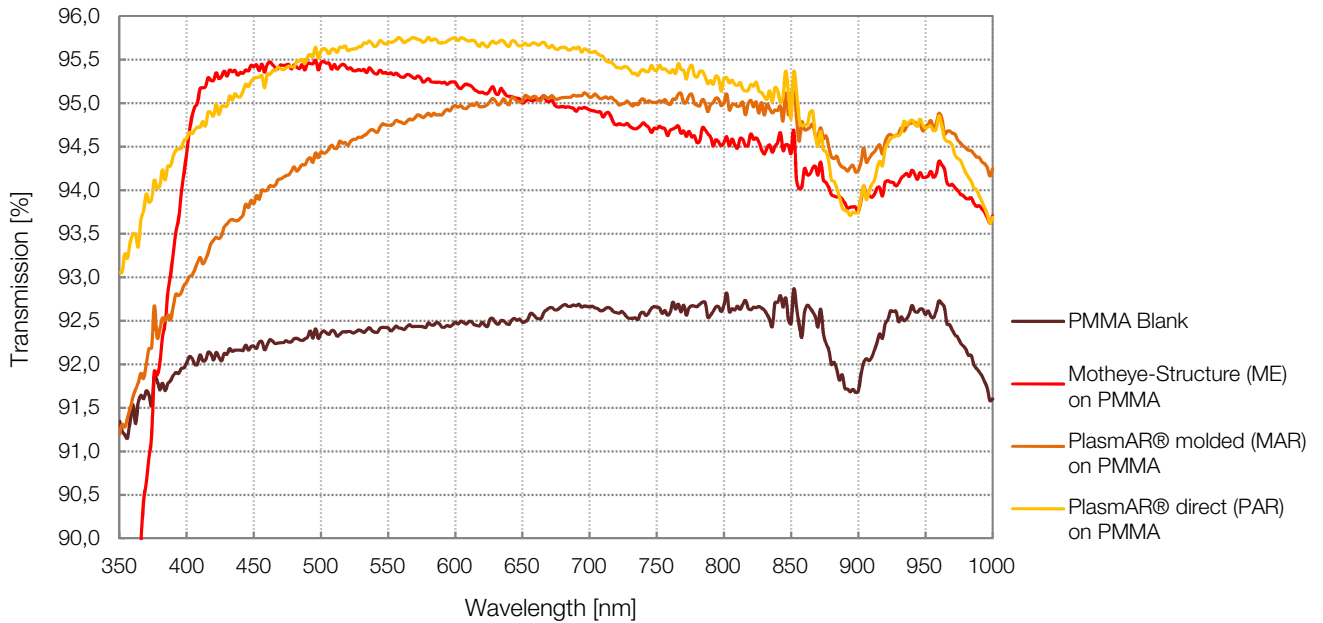
Properties	Motheye-Structure (ME)	PlasmAR® molded (MAR)	PlasmAR® direct (PAR)
available for plano surfaces	X	X	X
available for curved and microstructured surfaces	-	-	X
series production in compression molding	X	X	-
direct bombardment	-	-	X
maximum sizes	Ø 480 mm	Ø 480 mm	Ø 940 mm
sensitive to mechanical contact	X	X	-
angularly dependent residual reflection	X	-	-
arrangement of structure	periodical	stochastic	stochastic
broadband AR-effect	X	X	X
AR-effect is angularly independent up to 45°	X	X	X

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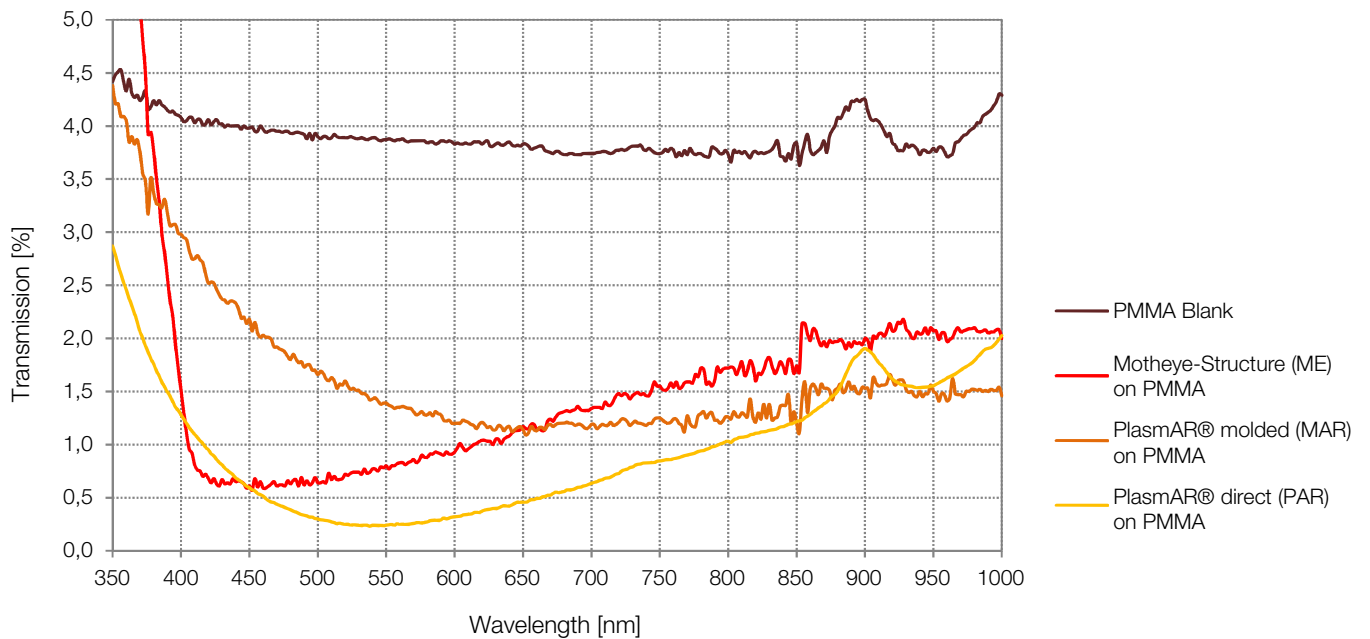


ANTIREFLECTIVE NANOSTRUCTURES

Principle curve: Comparison of transmission of AR-Nanostructures (part thickness 1 mm)



Principle curve: Comparison of residual losses of AR-Nanostructures (part thickness 1 mm)



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