

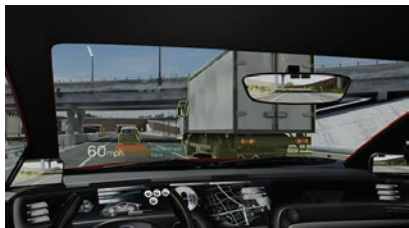


3M™ Windshield Combiner Film with PVB (3M WCF-PVB)

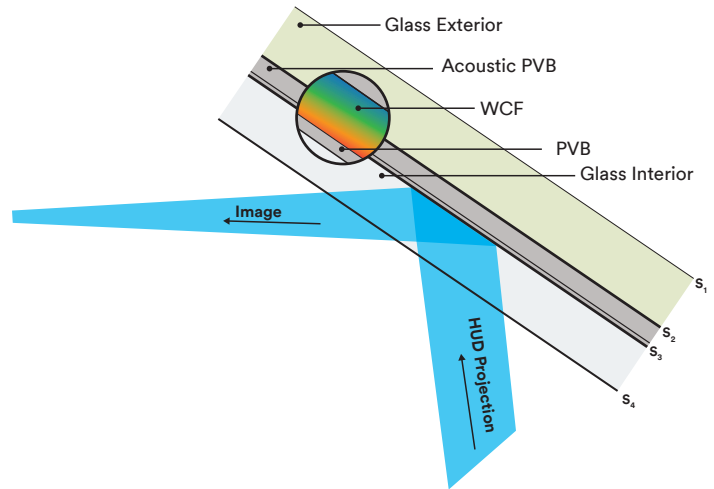
Product Description

3M Windshield Combiner Film (3M WCF) is a reflective polarizer under development for in-windshield glazing application optimized to improve Head Up Display (HUD) imaging. This film provides several benefits:

Safety	Design / EV	Augmented Reality (AR)
		
<p>Critical HUD safety information must always be viewable and legible.</p> <p>3M WCF is a solution for improved HUD imaging compatible with all drivers and viewing conditions including polarized sunglasses.</p>	<p>New vehicle designs, including EV, require HUD design flexibility.</p> <p>3M WCF gives more freedom to designers by providing superior images over a larger range of design geometries.</p>	<p>True functional AR requires a larger Field of View and multiple image distances to be effective.</p> <p>3M WCF is an enabler for AR by removing the geometrical limitations of the Wedge PVB.</p>

Application

- 3M WCF is a multilayer optical film tuned to selectively reflect P-polarized light for head-up display applications
- Creates an image visible under all conditions (including with polarized sunglasses) and that is insensitive to viewer height
- HUD unit needs to output P-Pol light
- 3M WCF-PVB is integrated in the glass interlayer stack as illustrated
- Target AOI for WCF application ~55° to 65° angle of incidence
- Designed for in-glazing between glass layers



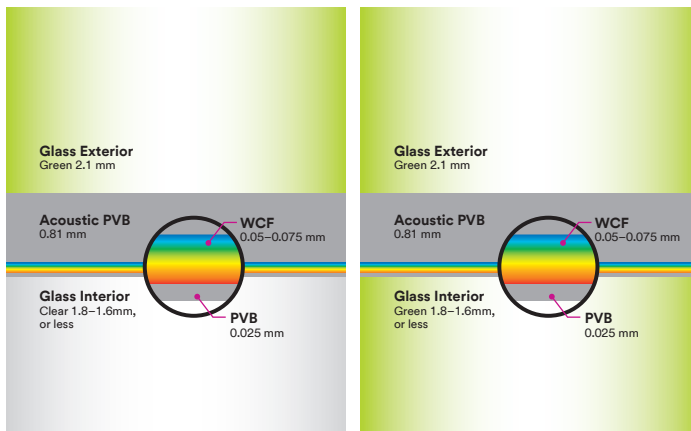
Optical Design

Visible P-Pol reflection (R_p) at AOI of 60°: $R_p = 25\% - 33\%$

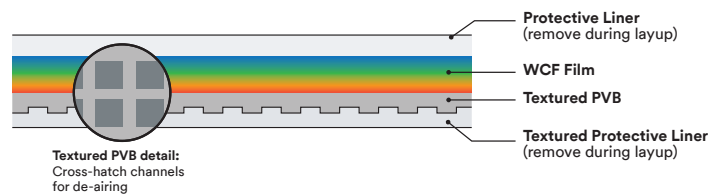
- Final P-Pol reflection target(s) depends on intended glass configurations

Visible Transmission (T_{vis}) @ AOI 0°: $T_{vis} \geq 78\%$

Example Constructions (In Glazing)



Typical Construction* (3M WCF-PVB)



*3M DMSD considers its films and tapes as homogeneous under European Union's Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (recast) (the RoHS Recast). The product construction described above does not represent the final homogenous film but is a tool to assist the customer in selecting the proper film that will suit their application needs.



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