

4. Conclusion

In conclusion, we designed the antireflective nanostructures on glass substrates by optimizing the shape and geometry of SWS for near 100% light transmission in a wide wavelength range. From the investigation of various SWS geometries using the RCWA simulation, the paraboloid is proved to be desirable for high transparent glasses. For the fabrication of SWS on glass substrate, the experimental results and theoretical calculations give a reasonable consistency. The parabola-shaped double-side SWS with a period of 200 nm and a height of 200 nm were optimized to guarantee over 99.5% transmittance in visible wavelength ranges. Also, it was found that the period of SWS should be smaller than at least 200 nm to satisfy the zero-order condition in glasses considering internal reflections. We believe that these results may provide fruitful insights to design and fabricate the highly transparent materials with SWS and other related optical devices.

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