

XR waveguides – Complete loop from the simulations to optically verified performance of diffractive waveguides

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Dispelix develops and delivers elegant and high-performance see-through waveguide combiners that are used as transparent displays in extended reality (XR) devices. We are a trusted and visionary partner for the industry leaders to redefine the complete experience of XR wearables.

Dispelix core technology is founded on pioneering work in the design, fabrication and metrology of inorganic surface-relief diffraction gratings on single-layer, high-refractive index waveguide substrates. Our technology platform spans from waveguide design and mastering to nanomanufacturing and metrology for mass production. Dispelix uses its self-developed, in-house software for designing waveguides. Our waveguide design software tools and team are globally unmatched.

In this presentation, I will explain the critical steps from optical requirements to simulation results and put emphasis on the manufacturing part and finish with the metrology. Completing this loop allows us to design and build the waveguides based on our vision of seamlessly integrating the virtual and real worlds. To achieve the user acceptance, similar weight needs to be given for all of the three requirements: i) optical performance, ii) visual appearance and iii) artifacts from ambient light. According to our vision, the XR glasses must feel, function and wear like normal eyeglasses. Fig. 1 represents our waveguides delivering all the above.



Fig. 1. Dispelix Selvä 1 waveguide for LED light source (left) and for Laser Beam Scanning (Right).

References

1. www.dispelix.com