Diffractive Augmented Reality (AR) Waveguides Fabricated by NIL: Manufacturing Challenges and Improved Approaches

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WaveOptics [1] designs and manufactures diffractive waveguides (see Figure 1), the key optical component in wearable AR devices. Our patented, high-performance AR waveguide technology [2] is designed for volume manufacturing at scale, a capability that has not been possible to date, to enable mass market adoption of AR across all leading market segments – industrial, enterprise and consumer. WaveOptics' diffractive waveguides seamlessly combine real and virtual worlds. Crisp text and imagery is projected by our near-eye displays, presenting computer images that overlay the real world. Augmented and mixed reality headsets can be designed with small, light and flexible form factors.

The present talk will include an overview of our manufacturing cycle (which involves several lithographic and nano-pattering techniques, including NIL, see Figure 2) and discussion of associated fabrication challenges. Improved approaches which are suitable for manufacturing of diffractive AR waveguides will be also discussed.

Reference:

[1] https://enhancedworld.com [2] Grey DJ. The ideal imaging AR waveguide. InDigital Optical Technologies 2017 2017 Jun 26 (Vol. 10335, p. 103350C). International Society for Optics and Photonics.

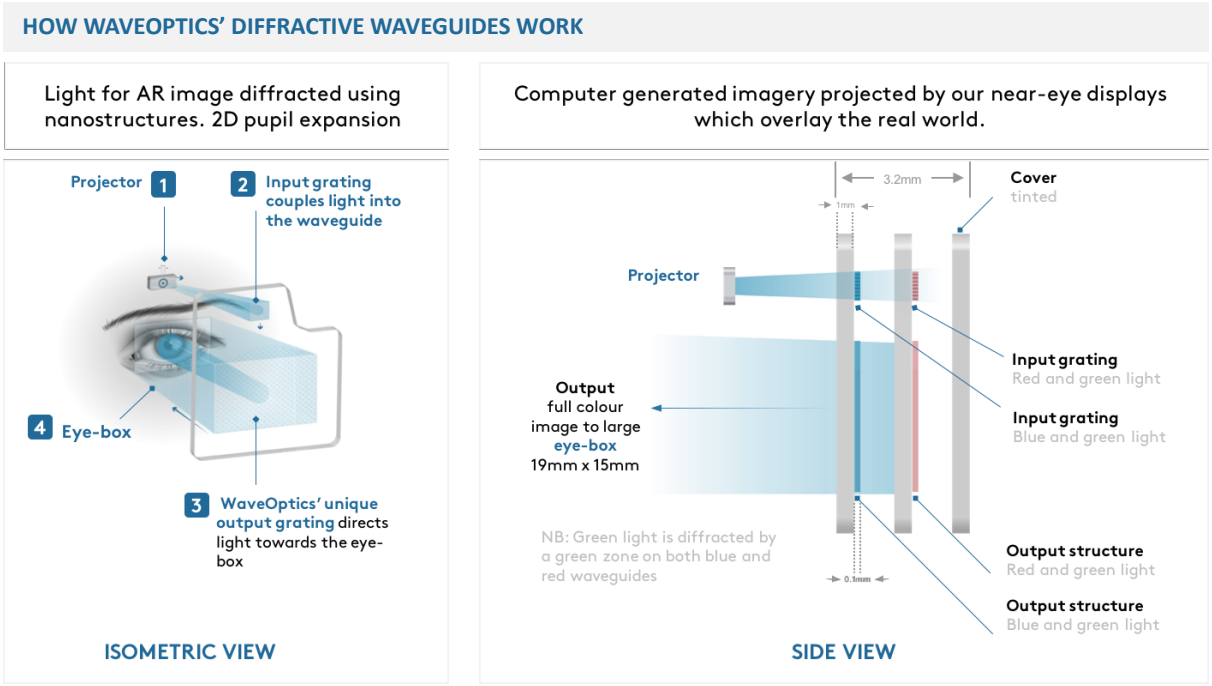

Figure 1. Operatic principals of Augmented Reality diffractive displays by WaveOptics

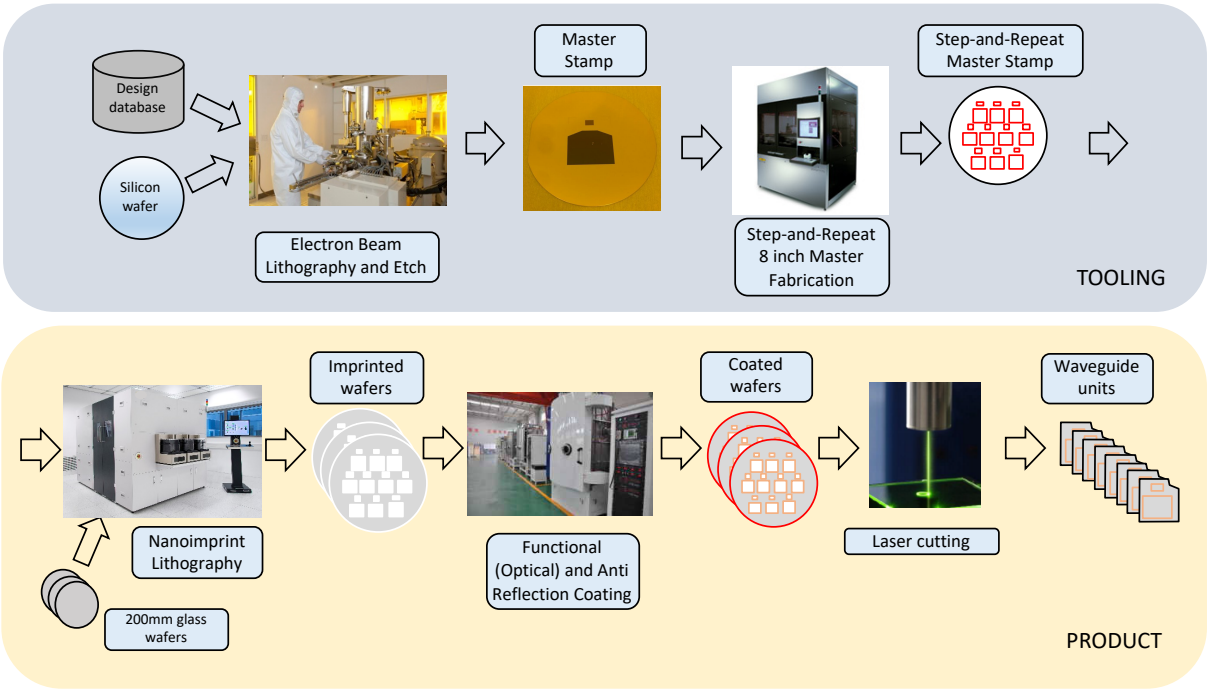

Figure 2. Full fabrication cycle for mass production of WaveOptics diffractive waveguides.