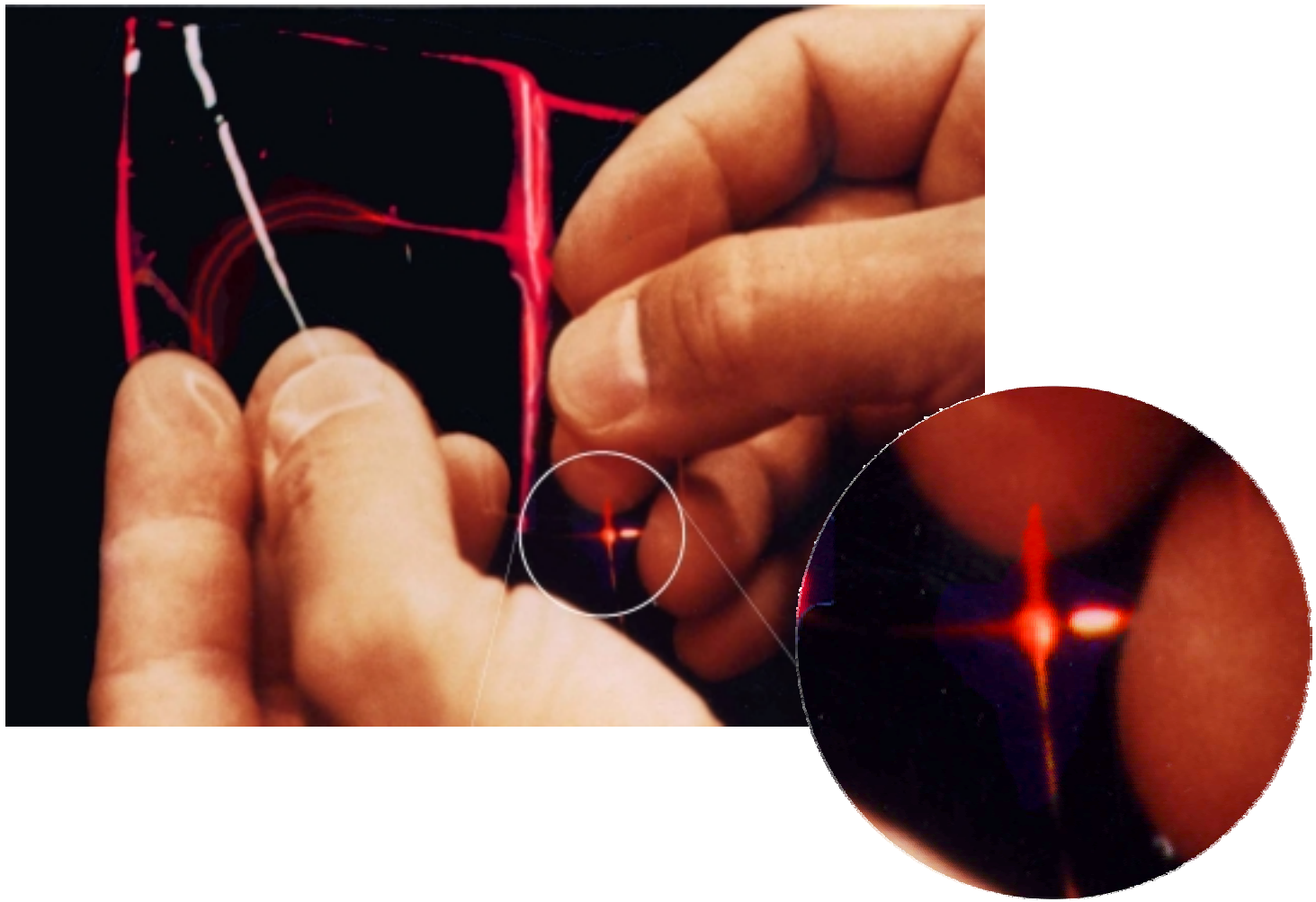
Polymer Technology Overview

Flexible Waveguide Structures

Driving optical integration



Highlights

Driving optical integration

- **Low cost “disruptive technology” is scalable to high volume production.**
- **Polymer material’s stability independently verified by major Telecom player. Qualification testing to Telcordia standards has begun.**
- **Focus is on “enabling” technology development for IT industries … high density interconnectivity solutions is a OXL core competency.**
- **Near-term focus is on short wavelength (600um-980um) multimode applications (e.g., VCSELs, VSR, Optical Bacplanes, MCMs)**
- **Long-term focus is evolution to long wavelength (1200um-17000um) applications (e.g., CWDM, Switching, Integrated Modules)**

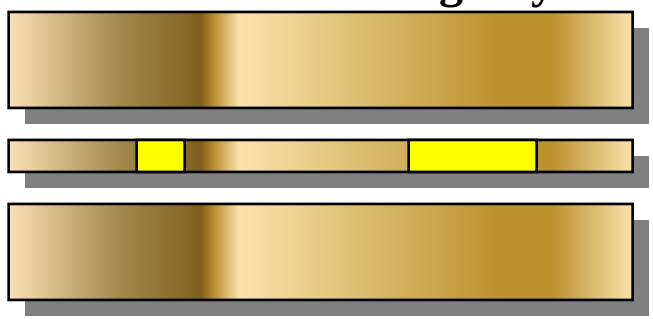
OC GuideLink™ Processing

Driving optical integration

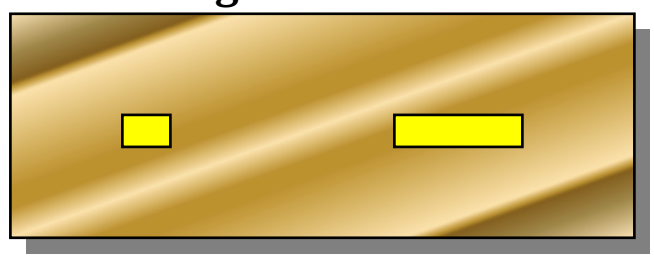
1. Apply Mask to Core Layer & Expose

Molecular Diffusion Occurs

2. Laminate Cladding Layers

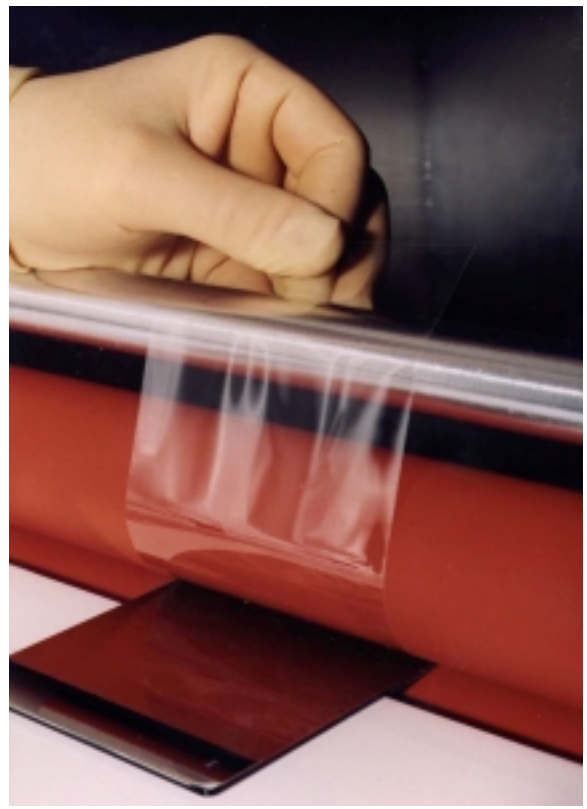


3. Homogenize & Crosslink



Laminating Mask to GuideLink™

Driving optical integration



Optical Circuits by the Yard™

Driving optical integration

… or by the mile if you need it !!!

√ **Totally unique and patented process:**

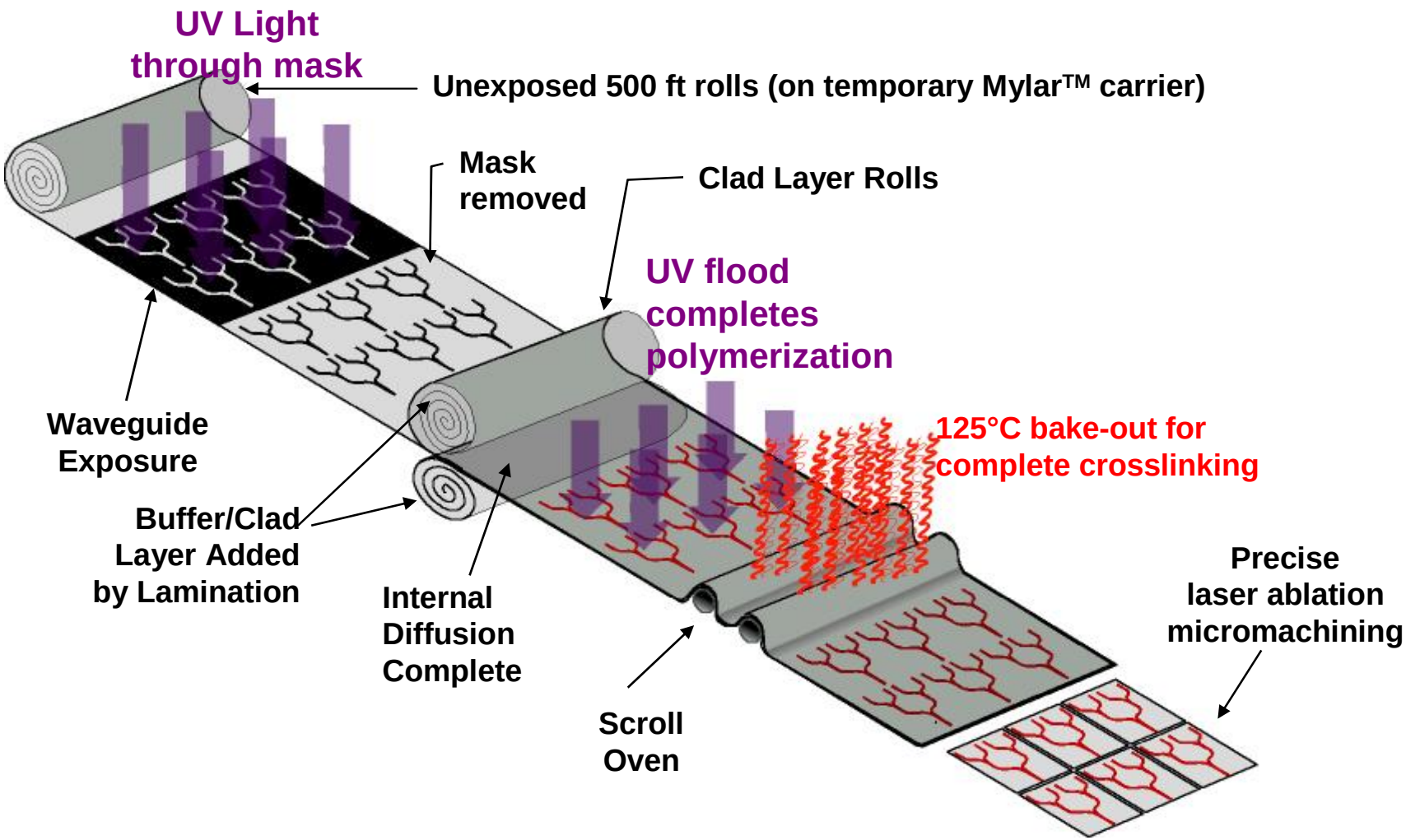
- **Proprietary monomer/polymer mixture is web coated onto a mylar host to form rolls of film**
- **Uniformity of the coating thickness is held to +/- 1 μm across entire roll**

√ **Scalable to very high volume manufacturing**

Volume Waveguide Manufacturing

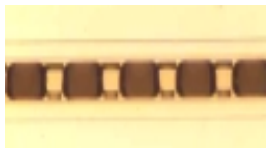
Driving optical integration

Continuous – reel-to-reel process capability



Ablation Enabled Functions

Driving optical integration

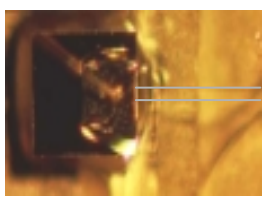


• **Passive fiber alignment: Precision "docking ports" with precision to ~0.3um are created to facilitate passive alignment of single or multi-mode fibers**

• **Example of passive fiber alignment: Top-down view of a SM fiber inserted into "docking port". Fiber core and waveguide were illuminated with HeNe laser to demonstrate low-loss fiber core, index-matching liquid monomer junction, and polymer waveguide visible.**

• **Turning mirrors and/or optical vias: Ablation technology allows for highly accurate beam steering**

• **Embedded passive components: Pictured are fixed dielectric filters locked into alignment with liquid monomer to create a CWDM**



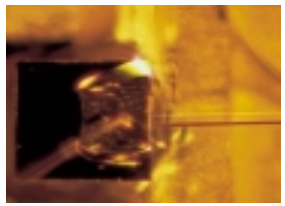
• **Embedded active components: Pictured is a laser chip inserted into waveguide structure*, aligned and locked into place with liquid monomer.**

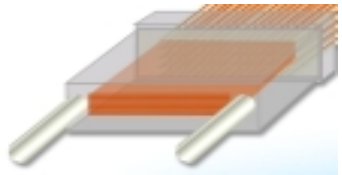
**** Waveguide enhanced for better viewing***

Interconnectivity Solutions

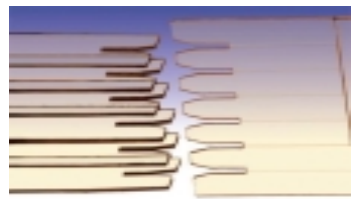
Driving optical integration

Embedded components for direct coupling into waveguide/film structure





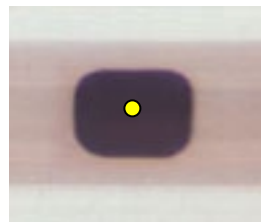
- **Couplings to waveguide/fiber or VCSEL arrays with standard MT footprint**
- **Connectors <0.5dB coupling loss; high density arrays (12 stacked layers - each up to 80 guides wide)**



Slot coupler arrays permit versatile functionality with right angle bends ~0.1dB coupling loss

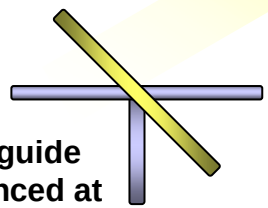
Internal Bragg grating for I/O λ selective deflection (variable % as needed)

Polymer Waveguide Circuits



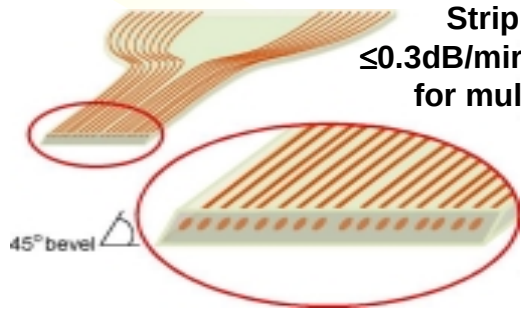
Precision "docking ports" permit passive fiber coupling with <0.5dB fiber/waveguide loss

Internal mirror for deflection or bubble switch/waveguide configurations balanced at ~0.2dB in either transmit or reflection state



Localized turning mirror for I/O ≤0.3dB/mirror loss

Strip mirrors ≤0.3dB/mirror loss for multiple I/O



Contact Information:

sales@opticalcrosslinks.com

500 North Walnut Road
Kennett Square, PA 19348
610.444.9469 phone
610.444.9491 – fax
Bruce Booth – CEO, x109
Ron Genova – President, x119
Jack Pund – CFO, x105