



Products & Services

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Specialized Adhesive-Free Bond (AFB®) Products

Onyx welcomes all inquiries about the feasibility of AFB® composite optical components. We are interested in discussing and manufacturing new material combinations and structural geometries. It is our goal to provide high-quality composites that will provide a solution for your system's needs, so we encourage any design submissions for review.

Large AFB® Components

Onyx has become well known for its ability to create crystals of large sizes through the application of AFB®. We have primarily used AFB® to produce both YAG and YVO4 crystals dimensionally larger than commercial growth can offer, which are then used to manufacture an AFB® optical component. This process would be applicable to a virtually all of the materials Onyx works with.

CVD Diamond

Onyx can AFB® CVD diamond to YAG or sapphire with or without coatings at the interface. The CVD diamond is popularly used as a heat-sink.

Flanged Rods/Slabs

Onyx can create light-guiding contours for rod and slab AFB® composite designs.

IR Windows and Transparent Armor

Onyx can apply its Adhesive-Free Bond (AFB®) technology to form large composite IR windows and transparent armor from materials such as sapphire, ALON, and spinel. These materials may not be commercially available in the sizes required and the application of tiled, edge-bonded AFB® provides a solution. The longest interface we have achieved to-date is 19" long (both sapphire and spinel) and we are currently working on a 30" long bond (sapphire). We also have the equipment capacity to polish the windows (up to 30" x 30") after bonding.

Advantages for IR Windows

- Sapphire, ALON, and spinel are all harder /more durable materials than what is currently used
- No transmission loss due to the bond

Advantages for Transparent Armor

- Lighter weight
- No reflection at the bond line; will not impact vision
- No strength loss due to the bond

