

Department of the Navy SBIR/STTR Transition Program

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ONR Approval #

Topic # NRL-3

Boron Carbide and Boron Nitride Shaped Ceramics from a Polymer Precursor

U.S. Naval Research Laboratory

WHO

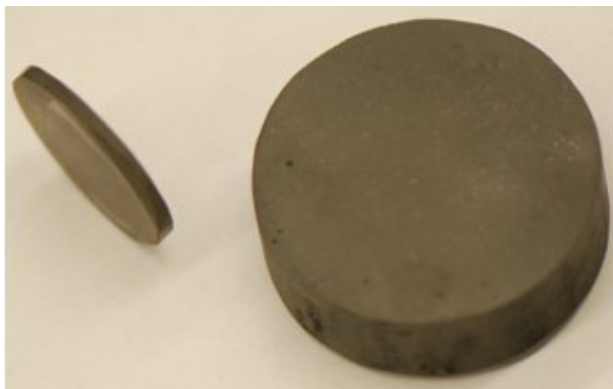
SYSCOM: ONR

Sponsoring Program:

Transition Target:

TPOC:

Other transition opportunities:



WHAT

Operational Need and Improvement:

Specifications Required:

Technology Developed: TNRL has developed a low-temperature, pressureless one-step method to synthesize dense, form-shaped boron carbide (B₄C) and/or nitride (BN) ceramics from a blend of a melttable polymer precursor and elemental boron. B₄C and BN ceramics are lightweight, resist wear and degradation, and are exceptionally hard materials. Currently, these ceramics are fabricated using ultra-purified boron carbide powders under extremely high pressures and temperatures. They are not economically viable for most applications. This new method of making larger shaped-forms of B₄C and BN delivers nanocrystalline refractory ceramics in all shapes and sizes with a simple, low-cost method. Applications that rely on ceramic materials with low density, high hardness, and excellent stability are: body and vehicle armor, cutting tools, hypersonics, engine components, heat shields, and shaped fiber-reinforced composite ceramics.

Warfighter Value:

WHEN

Contract Number: T2-ORTA-NRL-3

Milestone	Risk Level	Measure of Success	Ending TRL	Date
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HOW

Projected Business Model:

Company Objectives:

Potential Commercial Applications:

Contact: Technology Transfer Office,
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