

## Statement of Considerations

REQUEST BY SAINT-GOBAIN/NORTON INDUSTRIAL CERAMICS CORPORATION FOR AN ADVANCE WAIVER OF DOMESTIC AND FOREIGN RIGHTS IN SUBJECT INVENTIONS MADE IN THE COURSE OF OR UNDER DEPARTMENT OF ENERGY SUBCONTRACT 86X-SP234C UNDER CONTRACT DE-AC05-84OR21400, AND FOR CERTAIN SUBCONTRACTS AWARDED BY SAINT-GOBAIN/NORTON INDUSTRIES CERAMICS CORPORATION THE UNDER DOE WAIVER DOCKET W(A)-94-009 [ORO-576]

Saint-Gobain/Norton Industrial Ceramics Corporation (SGNICC) has made a timely request for an advance waiver to worldwide rights in Subject Inventions made in the course of or under its Subcontract 86X-SP234C with Martin Marietta Energy Systems, Inc., and for certain subcontracts awarded by SGNICC thereunder. The scope of the work calls for the development of cost effective manufacturing processes for two diesel engine parts, an exhaust valve for Detroit Diesel Corporation's Series 149 engine and a journal bearing shaft for NAVISTAR's New Generation Diesel (NGD), both made from NT451 SiAlON (NT451) of SGNICC's Norton Advanced Ceramics Division. The work is sponsored by the Office of Transportation Technologies.

The dollar amount of the Subcontract is \$6,322,536 with SGNICC cost sharing \$2,324,390, including a foregone fee and facilities capital cost of money, amounted to 37% of the Subcontract. This subcontract is one of three awarded under RFP-SM 400-86. The other subcontracts are Kyocera Industrial Ceramics Corporation and Golden Technologies Company, Inc. Each of these subcontracts are cost-shared and advance waivers have been requested.

SGNICC was established as a United States corporation in 1992 and it consists primarily of what was formerly Norton Company Advanced Ceramics Division. In 1993, SGNICC acquired TRW's 50% share of the former joint venture Norton/TRW Ceramics. All of the personnel, facilities and equipment of the joint venture became part of a new division within SGNICC, Norton Advanced Ceramics Division (Norton).

Norton is the lead in a team that will address the program goals that includes Detroit Diesel Corporation, Deco Grand Inc., IBIS Associates, BDM International Company, and Centorr/Vacuum Industries, Inc.. SGINCC is making the waiver request on behalf of itself as well as on behalf of the other team members, with the exception of Deco Grand and IBIS which already have rights to inventions pursuant to Bayh-Dole. Letters approving SGINCC's acting in this capacity have been received from all appropriate team members (copies attached). All team members have the experience necessary to develop and commercialize the technology that is the subject of their respective subcontracts.

Norton has extensive experience in the development of silicon nitride powder as well as in its commercialization. One of Norton's successes is the manufacture of MgO-containing silicon nitride compositions to make bearing components which won an IR-100 award in 1986. Other ceramics made by Norton

have been used in high temperature gas turbine applications and in commercial and military development programs.

The material to be used in the development of the parts covered by the subcontract, NT451, is made, formed, fired, machined and inspected at Norton's pilot plant in Salem, New Hampshire. Commercialization has taken the form of the production of over 10,000 ceramic parts supplied to every major engine builder in the free world. Ceramic valves made from the material have accumulated between 50,000 and 300,000 miles in standard road vehicles, and performance valves have performed under track trials and races of 250 KM at engine speeds in excess of 14,000 RPM. Other miscellaneous components made of NT154 continue to be successfully tested in various engine applications.

SGNICC is the largest producer of advanced ceramics for thermomechanical and mechanical applications and a leader in developing and commercializing advanced ceramics for use as components in heat engines and other structural applications. Therefore, SGNICC's experience and expertise will contribute substantially to commercialization of the inventions made under the Subcontract.

Centorr/Vacuum Industries, Inc. (Centorr) has specialized in high temperature (1200°C-3000°C) controlled atmosphere furnace design for over 30 years and has been researching and developing the continuous sintering of nitride compositions for the past 4 years. They have applied for patents to improvements to the belt material and hot zone design and have participated in research under the Ceramic Technology for Advanced Heat Engines Project of the Advanced Materials Development Program under Martin Marietta Energy Systems, Inc., prime contract at Oak Ridge Operations. In addition they have invested over \$300,000 researching and developing continuous furnace systems for processing  $\text{Si}_3\text{N}_4$ . Therefore, Centorr's experience and expertise will contribute substantially to the commercialization of the inventions developed under the subcontract.

Detroit Diesel Corporation (DDC), was formed in January 1988, to design, manufacture and sell diesel engines. Its predecessor, the Detroit Engine Division of General Motors Corporation, was established in 1938. DDC has extensive experience with heavy-duty diesel engines, and it pioneered cast-in-place monolithic silicon nitride valves in the Low Heat Rejection engine. DDC is currently working in NASA's Advanced Diesel Engine Component Development Program and the Advanced Ceramic Technology Insertion Program, both related to the use of ceramic materials for engine parts. Thus, DDC has the experience to develop and market inventions made under its subcontract.

BDM International Company (BDM), which is developing an Intelligent Processing of Materials (IPM) system for spray drying, has been a leader in IPM technology development for powder consolidation using hot isostatic pressing. It has invested about \$3.5 million in research and development in IPM and holds a patent for the process, system architecture, and complete system apparatus for consolidation modeling and intelligent control of consolidation of powder and composite materials. BDM also has installed a complete IPM system for the Navy and is in the planning stages for installing similar systems at two commercial sites. Therefore, BDM has demonstrated that it has

the technical ability to develop this technology as well as the marketing ability to commercialize it.

The Subcontract has been executed and is proceeding with the standard DOE long form Patent Rights clause. If the requested waiver is approved, a patent rights clause embodying the standard DOE waiver terms and conditions, approved by SGNICC, including march-in rights, retention by the government of a license, preference for U.S. industry, and U.S. Competitiveness clauses will be added by a no-cost modification to the contract. The advance patent waiver will also contain a paragraph that limits SGNICC's ability to alienate waived rights. Specifically, SGNICC shall not transfer rights in any invention without prior approval of DOE. Also, should there be a change in ownership of SGNICC, rights in inventions will be suspended until approval by DOE of the entity obtaining controlling interest having the waiver.

As noted above, SGNICC has agreed to the attached U.S. Competitiveness Clause in which it agrees that any product, process, or service using a U.S. Patent resulting from a subject invention or any other intellectual used in performing work under its subcontract shall be manufactured or protected substantially in the United States. SGNICC has agreed to flow the terms and conditions of Exhibit 1D, Patent Rights (Advance Waiver) (3-92), to each of the identified large business subcontractors, including paragraph 0 entitled "U.S. Competitiveness."

Granting of the waiver should have little effect on competition since there are several technology options, this being one of many previously or yet-to-be developed in the marketplace. Therefore there should not be undue market concentration of SGNICC products.

Grant of the requested waiver should serve as encouragement to other DOE subcontractors that significant cost sharing will be recognized as an acceptable consideration for granting greater rights in Subject Inventions.

In view of the acceptable level of cost sharing by SGNICC and the objectives and considerations set forth in 41 CFR 9-9.109, all of which have been considered, it is recommended that the requested waiver for worldwide rights be granted.




Katherine Lovingood  
Senior Patent Attorney

Based on the foregoing Statement of Considerations and the representations in the attached Waiver Petition, it is determined that the interest of the United States and the general public will best be served by a waiver of U.S. and foreign patent rights, and therefore, the waiver is granted. This waiver shall not apply to a modification or extension of the cost-shared subcontract where, through such a modification or extension, the purpose, scope or cost of the subcontract has been substantially altered.


CONCURRENCE:

APPROVAL:

  
Thomas J. Gross  
Deputy Assistant Secretary  
for Transportation Technologies,  
Energy Efficiency and Renewable  
Energy

Date:

8/28/95

  
Paul A. Gottlieb  
Assistant General Counsel  
for Technology Transfer and  
Intellectual Property

Date:

8-29-95

W(A)-94-009  
ORO-576

WAIVER ACTION ABSTRACT

| <u>REQUESTOR</u>   | <u>CONTRACT SCOPE OF WORK</u>   | <u>RATIONALE FOR DECISION</u>  | <u>DISPOSITION</u> |
|--|---|--|--------------------|
| Saint-Gobain/<br>Norton Industrial<br>Ceramics Corporation | Development of cost<br>effective manufacturing<br>processes for diesel<br>engine parts. | 37% cost share and<br>agreement to substantially<br>manufacture in the United<br>States. | Grant Waiver       |