**Next Page** 

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# DEFENSE INDUSTRIAL BASE ASSESSMENT: Strategic Materials - CARBON FIBER COMPOSITE MATERIALS



#### SCOPE OF ASSESSMENT

The U.S. Department of Commerce, Bureau of Industry and Security (BIS), Office of Technology Evaluation (OTE), in coordination with the Defense Logistics Agency (DLA) is conducting an industrial base survey and assessment of the supply chain associated with select critical and strategic materials required for key defense systems and platforms. The focus of this survey is on the materials involved in the manufacture of carbon fiber composites.

The primary goal of this assessment is to assist the defense community in understanding the health and competitiveness of critical material suppliers, and identify specific issues and problems facing the industry. Over the longer term, agencies will be better informed to develop targeted planning and acquisition strategies to ensure the availability of the materials supply chain to support critical defense missions and programs.

### **RESPONSE TO THIS SURVEY IS REQUIRED BY LAW**

A response to this survey is required by law (50 U.S.C. app. Sec. 2155). Failure to respond can result in a maximum fine of \$10,000, imprisonment of up to one year, or both. Information furnished herewith is deemed confidential and will not be published or disclosed except in accordance with Section 705 of the Defense Production Act of 1950, as amended (50 U.S.C App. Sec. 2155). Section 705 prohibits the publication or disclosure of this information unless the President determines that its withholding is contrary to the national defense. Information will not be shared with any non-government entity, other than in aggregate form. The information will be protected pursuant to the appropriate exemptions from disclosure under the Freedom of Information Act (FOIA), should it be the subject of a FOIA request.

Not withstanding any other provision of law, no person is required to respond to nor shall a person be subject to a penalty for failure to comply with a collection of information subject to the requirements of the Paperwork Reduction Act unless that collection of information displays a currently valid OMB Control Number.

#### BURDEN ESTIMATE AND REQUEST FOR COMMENT

Public reporting burden for this collection of information is estimated to average 14 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information to BIS Information Collection Officer, Room 6883, Bureau of Industry and Security, U.S. Department of Commerce, Washington, D.C. 20230, and to the Office of Management and Budget, Paperwork Reduction Project (OMB Control No. 0694-0119), Washington, D.C. 20503.

<u>Previous Page</u>		Next Page							
	Table of Contents								
<u>1</u>	<u>I</u> General Instructions								
<u>II</u>	Definitions								
<u>1</u>	Organization Information								
<u>2</u>	Products								
<u>3</u>	Key Suppliers, Inventories, Inputs, and Sourcing								
<u>4</u>	Operations and Challenges								
<u>5</u>	Competitiveness and Outlook	Important Note:							
<u>6</u>	U.S. Government and DOD Participation	Complete Section 2 before moving on to later sections. Menu options in later sections are							
<u>7</u>	Sales	based on information in Section 2.							
<u>8</u>	Customers								
<u>9</u>	Financials								
<u>10</u>	Workforce								
<u>11</u>	Research and Development								
<u>12</u>	Capital Expenditures								
<u>13</u>	Outreach and Certification								
	BUSINESS CONFIDENTIAL - Per Section 705(d) of the I	Defense Production Act							

Previous Page **Next Page Section I: General Instructions** Your organization is required to complete this survey using an Excel template, which can be downloaded from the U.S. Department of Commerce, Bureau of Industry and Security (BIS) website: www.bis.doc.gov/CFSurvey. At your request, survey support staff will e-mail the Excel survey template directly to your organization. For your convenience, a PDF version of the survey is available on the BIS website to aid internal data collection. DO NOT submit the PDF version of your organization's response to BIS. Respond to every question. Surveys that are not fully completed will be returned for completion. Use comment boxes to provide any information to supplement responses provided in the survey form. Make sure to record a complete answer in the cell provided, even if the cell does not appear to expand to fit all the information. DO NOT COPY AND PASTE RESPONSES WITHIN THIS SURVEY. Survey inputs should be made manually, by typing in responses or by use of a drop-down menu. The use of copy and paste can corrupt the survey template. If your survey response is corrupted as a result of copy and paste responses, a new survey will be sent to you for immediate completion. Do not disclose any classified information in this survey form. If information is not available from your organization's records in the form requested, you may furnish estimates. Questions related to this survey should be directed to BIS survey staff at CFSurvey@bis.doc.gov or by calling survey support staff and team lead David Boylan at 202-482-7808. Email is the preferred method of contact. Upon completion, review, and certification of this Excel survey, transmit the survey via e-mail attachment to: CFSurvey@bis.doc.gov. Be sure to retain a copy for your records. For questions related to the overall scope of this strategic materials industrial base assessment, contact: Brad Botwin, Director, Industrial Studies Office of Technology Evaluation, Room 1093 U.S. Department of Commerce, BIS 1401 Constitution Avenue, NW Washington, DC 20230

Term	Section II: Definitions  Definition
Alloyed Metal	A metal made by combining two or more metallic elements to give, for example, greater strength or resistance to corrosio
Applied Research	Systematic study to gain knowledge or understanding necessary to determine the means by which a recognized and specified med may be met. This activity includes work leading to the production of useful materials, devices and systems or method
Applied Research	including design, development, and improvement of prototypes and new processes.
Authorizing Official	Executive officer of the organization or business unit or other individual who has the authority to execute this survey on be of the organization.  Systematic, scientific study directed toward greater knowledge or understanding of the fundamental aspects of phenomen
Basic Research	and of observable facts without specific applications towards processes or products in mind.  Commercial and Government Entity (CAGE) Code identifies companies doing or wishing to do business with the U.S. Feder
Commercial and Government Entity (CAGE) Code	Government. The code is used to support mechanized government systems and provides a standardized method of identifying a given facility at a specific location. Initial CAGE codes at: <a href="http://www.logisticsinformationservice.dla.mii/BiNCS/begin_search.aspx">http://www.logisticsinformationservice.dla.mii/BiNCS/begin_search.aspx</a>
Component	Any raw material, substance, piece, part, software, firmware, labeling, or assembly which is intended to be included as part the finished, packaged, and labeled device.
Customer	An entity to which an organization directly delivers the product or service that the facility produces. A customer may be another company or another facility owned by the same parent organization. The customer may be the end user for the il but often will be an intermediate link in the supply chain, adding additional value before transferring the item to yet anoth customer.
Data Universal Numbering System (DUNS)	A nine-digit numbering system that uniquely identifies an individual business. Find DUNS numbers at: http://fedgov.dnb.com/webform
Direct Support	Product/service is provided by your organization to the specified customer, not through a third party (for example, prime contractor or distributor).
Distributor	An entity that buys noncompeting products or product lines, warehouses them, and resells them to retailers or directly to end users or customers.
Finished Product	Any product, or accessory to any product, that is suitable for use or capable of functioning, whether or not it is packaged of labeled.
Full Time Equivalent (FTE) Employees	Employees who work for 40 hours in a normal work week. Convert part-time employees into "full time equivalents" by tal their work hours as a fraction of 40 hours.
Indirect Support	Product/service is provided to the specified customer through a third party (for example, prime contractor or distributor).
Manufacturer	An organization that uses labor and capital to convert raw materials into finished or semi-finished goods. For the purpose this survey, manufacturing includes integration and assembly.
Manufacturing Material	Any material or substance used in or used to facilitate the manufacturing process, a concomitant constituent, or a byproduct constituent produced during the manufacturing process, which is present in or on the finished device/product.
Matrix	The material that binds together the reinforcing fibers of a composite.
Modulus	The tensile modulus of the carbon fiber. Throughout this survey modulus will be measured in million pounds per square in (MSI). The gradations are as follows, with both MSI and gigapascals (GPa) included for reference: Standard (below 40 MSI 275 GPa); Intermediate (40-50 MSI / 275-345 GPa); High (50-65 MSI / 345-450 GPa); and Ultrahigh (Over 65 MSI / 450 GPa)
North American Industry Classification System (NAICS) Code	North American Industry Classification System (NAICS) codes identify the category of product(s) or service(s) provided by a organization. First NAICS codes at: http://www.census.gov/pcc/d/www/naics.html
Precious Metals	Metals that have high economic value due to their rarity. Most commonly gold, silver, platinum, and palladium.
Prepreg	A fiber-based material in which the matrix material is already present but not yet fully cured.
Product/Process Development	The systematic application of knowledge or understanding, directed toward the production of useful materials, devices, as systems or methods, including design, development, and improvement of prototypes and new processes to meet specific requirements.
Rare Earth Element	A category that includes element numbers 57-71 of the periodic table (lanthanum, cerium, praseodymium, neodymium, promethium, samarium, europium, gadolinium, terbium, dysprosium, holmium, erbium, thulium, ytterbium, and lutetium well as yttrium (39) and scandium (21).
Service	An intangible product (contrasted to a good, which is a tangible product). Services typically cannot be stored or transporte are instantly perishable, and come into existence at the time they are bought and consumed.
Single Source	An organization that is designated as the only accepted source for the supply of parts, components, materials, or services, even though other sources with equivalent technical know-how and production capability may exist.
Sole Source	A organization that is the only source for the supply of parts, components, materials, or services. No alternative U.S. or no U.S. based suppliers exist other than the current supplier.
STEM	STEM stands for Science, Technology, Engineering and Mathematics.
Supplier	An entity from which your organization obtains inputs. A supplier may be another firm with which you have a contractual relationship, or it may be another facility owned by the same parent organization. The inputs may be goods or services.
Unalloyed Metal	A metal in its pure form, not combined with any other substance.
United States	The "United States" or "U.S." includes the 50 states, Puerto Rico, the District of Columbia, the island of Guam, the Trust Territories, and the U.S. Virgin Islands.
	The percentage of an organization's potential output that is actually being used in current production, where potential output

Prev	ous Page				Next Page					
		Section 1a: Organization Info	rmation							
Α	om the dropdown, select the description that best identifies your organization:  dicate whether this survey response captures the operations of your whole organization or an individual business unit/division.									
В		or individual responses for each business unit/division with carbon fiber composite-related								
	Is this the sole response for your organization, or will additional	business units/divisions be submitting responses?								
	Unless a single corporate response is provided, all business units/divisions with carbon fiber composite-related activities must submit a response.									
	Provide the following information for the level at which your org	ganization is responding to this survey:								
	Organization Name									
	Business Unit/Division Name (if applicable)									
	Street Address									
С	City									
_	State									
	Zip Code									
	Website									
	Phone Number									
	Primary DUNS Code for this Level (nine digit number with no dashes)									
	Provide the following information for your parent company, if applicable:									
	Organization Name									
	Street Address									
D	City									
	State									
	Country									
	Postal Code/Zip Code									
	Primary DUNS Code for Parent Company (nine digit number									
	with no dashes)									
Ε	Is your organization publicly traded or privately held?									
	Point of Contact regarding this survey:									
F	Name	Title	Phone Number	E-mail Address	State					
Co	mments:									
		BUSINESS CONFIDENTIAL - Per Section 705(d) of	the Defense Production Act							

Prev	ious Page	Next Page
	Section 1b: Organization Information	
	From the list below, identify any of the market segments your organization curren	tly serves:
	Aerospace	
	Automotive	
	Consumer goods	
	Construction/Infrastructure	
	Electronics	
١.	Engineering	
Α	Food/Agriculture	
	Healthcare/Medical	
	Industrial	
	Marine (surface and underwater)	
	Research and Development	
	Space (satellites, launch, instruments, support, etc.)	
	Telecommunication	
	Other (specify)	
	From the list below, identify any of the <b>defense-related</b> market segments that you	ir organization currently serves:
	Aircraft	
	Command, Control, Communications, Computers, Intelligence, Surveillance, and	
	Reconnaissance (C4ISR)	
	Electronics	
В	Energy/Power Generation	
	Ground Vehicles	
	Missiles	
	Research and Development	
	Marine (surface and underwater)	
	Space (specify)	
	(specify)	
Co	mments:	
	BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense	Production Act

Prev	<u>rious Page</u>	Next Page						
	Section 1c: Organization Information							
	From the list below, select all business lines related to carbon fiber-based composites in which your o manufactures or distributes products.	rganization currently						
	Precursor chemical							
	Carbon fibers							
	Carbon fiber textiles/fabrics/tapes, etc. (including prepregs)							
Α	Composite resins/matrices							
	Composite structures							
	Product integration/assembly							
	Maintenance, repair, or overhaul							
	Other business line(s) (specify)							
	Other business line(s) (specify)							
	Is your organization considered a small business, as defined by the Small Business Administration (SBA	<i>t</i> );						
	For information on SBA's small business size standards, see:							
	http://www.sba.gov/category/navigation-structure/contracting/contracting-officials/eligibility-size-	<u>standards</u>						
В	If yes, specify the type of small business (e.g., minority-owned, 8(a), etc.):							
	Provide the following identification codes (see definitions), as applicable, to your organization.							
	*Find your organization's Commercial and Government Entity (CAGE) Codes at: <a href="http://www.logisticsinformationservice.dla.mil/BINCS/begin_search.aspx">http://www.logisticsinformationservice.dla.mil/BINCS/begin_search.aspx</a>							
	nttp://www.logisticsinformationservice.dia.mii/BiNCs/begin_search.aspx							
	**Find your organization's North American Industry Classification System (NAICS) codes at:							
	http://www.census.gov/epcd/www/naics.html							
С	Commercial and Government  NAICS (6-digit)	Codo(s)**						
	Entity (CAGE) Code(s)*	code(s)						
Со	omments:							
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Previou	s Page							Next Page
					Section 1d: Organization Informat	ion		
Identi	fy all of your organization's	facilities with carbon fib	er composite-related op	erations.				
			Location	Ou	utlook			
	Facility Name	City	State	Country	Facility Primary Operation (select from dropdown)	Specify Additional Detail or Other Business Line	Do you anticipate any significant changes in the operations at this facility over the next five years?	If yes, provide a brief explanation.
1								
2								
3								
4								
5								
6		+						
8					+			
9								
10		+						
Comn	nents:		<u>l</u>	1	•	1		
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Complete the table below to describe ALL of your organization's capabilities regarding carbon fiber composite-related products. This includes both items sold externally and those produced and used within your organization. For example, if your organization produces carbon fibers or woven carbon materials later used to produce a composite component products at each stage must be included.

In the PRODUCT COMPOSITION portion, where applicable specify the TYPE OF PRECURSOR and MODULUS OF THE CARBON FIBER in the product, the TYPE OF MATRIX in the product,

whether the product is itself or contains PREPREG, and provide a brief ADDITIONAL DESCRIPTION with any additional information/unique properties of the product. If you indicated OTHER in any section, specify the makeup of the product here.

In the END USE portion, indicate the primary SECTOR the final product is used in, its PRIMARY APPLICATION, as well as a more complete END USE DESCRIPTION, if known.

In the PRODUCT DISPOSITION portion, estimate the percentage of this product USED ENTIRELY WITHIN YOUR ORGANIZATION, and whether your organization is a SOLE SOURCE for the product

						Product Compo				End Use		Product Disposition	on
	Product Name (write-in)	Product Type	Manufacture / Distribute	Precursor Type	Carbon Fiber Tensile Modulus	Matrix Type	Prepreg Made or Used	Additional/Other Description (write-in)	Primary Sector Use	Primary Application	End Use Description (write-in)	Percentage used entirely within your organization	Sole Source of Product
1													
2													
3													
4													
5													
6													
. 7													
8													
9													
10													
11													
12													
13													
14													
15													
Commer	nts:								-		•	•	
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Previ	<u>vious Page</u> Next Page											
				Section 2b:	Other (Non-Carbon Fiber Composite-	Related) Products						
А	Does your organization provide non-carbon fiber composite-related products and/or services? If no, proceed to Section 3a.											
:	Select the <b>TYPE of</b>	MATERIAL your organiz	ation supplies and provide a		DESCRIPTION with any additional mat	terials details in the product. e of end use, and, if needed, provide an <b>ADD</b> I	TIONAL/OTHER DESCRIPTION.  End Use					
		laterial Type from dropdown)	Product Name (write-in)	Product Description (write-in)	Manufacture/ Distribute (select from dropdown)	Primary Sector End Use (select from dropdown)	Primary End Use Application (select from dropdown)	Additional/Other Description (write-in)				
В	1 2 3 4											
-	5 6 7 8											
-	9 10 11											
	12 13 14											
	Comments:											
				BUSINESS CONFI	DENTIAL - Per Section 705(d) of the D	efense Production Act						

Previous Page	Next Page
Section 3a: Suppliers for CARBON FIBER COMPOSITE - RELATED Product Lines	
For each of the products your organization identified in the PRODUCTS Section (2a), indicate the name of EXTERNAL SUPPLIERS providing key inputs.	

Where applicable, specify the TYPE OF PRECURSOR and MODULUS OF THE CARBON FIBER in the product, the TYPE OF MATRIX in the product, whether the product is itself or contains PREPREG, and provide a brief additional DESCRIPTION with any additional information/unique properties of the product. If you indicated OTHER in any section, specify the makeup of the product here.

In the INPUT PRODUCT APPLICATION portion, indicate which of your products identified in Section 2 use this input. If a single supplier is used for multiple inputs, repeat their information on an additional row.

			In	put Information				Supplier Information			Input Product Application	
Supplier Name	Input Type	Precursor Type	Carbon Fiber Tensile Modulus	Matrix Type	Prepreg	Description (write-in)	Supplier State	Supplier Country	Single/Sole Source	Carbon Fiber Composite- Related Product 1	Carbon Fiber Composite- Related Product 2	Carbon Fiber Composite- Related Product 3
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												

Comments:

Prev	vious Page									Next Page
				Section 3b: Inputs						
	Estimate your organizati	on's average inventory	<u> </u>	e inputs (in weeks), based	on the last two years of or					
			Fibers (weeks of inventory)	Prepreg Fabrics (weeks of inventory)			Mate (weeks of i	atrices		
	Standard Modulus PAN- (<40 MSI)	based fibers	(Weeks of inventory)	(Weeks of inventory)	Polyimide Resin			vento.yy		
Α	Intermediate Modulus P (40-50 MSI)	AN-based fibers			Bismaleimide Resin					
	High Modulus PAN-base (50-65 MSI)				Ероху					
	Ultrahigh Modulus PAN- (>65 MSI)	based fibers			Other (specify here)	Other (specify here)				
	For each material listed	below, identify which is	ssues your organization h	as experienced since 2010:						
	Material	Input Availability Problems	Supply Chain Disruption	s Obsolescence	Severe Input Price Fluctuations				in	
	Precursor chemical for carbon fiber									
В	Carbon fiber									
В	Carbon fiber textiles									
	Resin, epoxies, etc.									
	Other									
	Describe any steps you h	nave taken to minimize	the risk posed by the issu	ies above:						
		· · · · · · · · · · · · · · · · · · ·		cal components and/or ma	terials no longer being pro	duced?				
			ny such problems in the n							
	Identify reasons for thes Environmental	e problems by selecting	g past, future, both, or ne	either:				1		
С	Regulations		Production Costs		Export Controls			Other	(specify here)	
	Other Regulations		End of Product Life Cycle		Foreign Competition			Other	(specify here)	
	Describe the problems a	nd any steps you have	taken to minimize the ris	ks posed by the issues abo	ve:					
	If your organization pure	chases carbon fiber as a	a fiber or fabric, is it prima	arily from a manufacturer o	or through a distributor?					
	If your organization were continue normal operati		chase carbon fiber from y	our current primary suppli	er, for how many weeks w	ould you be a	ble to			
D	How many weeks would	it take your organization	on to find a new supplier	that can meet your produc	tion needs?					
	Provide an explanation f	or your answer above:								
Co	omments:		<u> </u>							
			BUSINESS COI	NFIDENTIAL - Per Section 7	05(d) of the Defense Prod	luction Act				

Prev	vious Page										Next Page
					Section 3c: Inpu	ts and Sourcing					
Α	Doos your organization	utiliza any of the mat	erials listed in part A (below) for carbon	fiber composite rela	tod aparations other on	arations or both? If	vou use none of the li	stad materials press	nd to Costion 4		
А				nber composite-reia	ted operations, other opi	erations, or both? If	you use none or the ii	sted materials, procei	ed to Section 4.		
	Complete the informat	ion below for each ma	terial your organization utilizes.								
	In the DIRECT SOLIRCE	nortion coloct the TVE	PE of supplier providing the product (opt	ions includo: Distribu	itor: Mino Original Mani	ifacturor Pocyclor) a	and the cumplior's LOC	ATION In the BRIMA	DA UDICINIVI CUITOCE CUITINA	DV column indicate t	ha country where the
	material originally cam		e or supplier providing the product (opt	ions include. Distribu	itor, wille, Original Marit	ilacturer, Recycler) a	ind the supplier's LOC	ATION. III tile PRIIVIA	NT ORIGINAL SOURCE COON I	Ki column, malcate t	ne country where the
	material originally can	ie irom (ir kirown).							Direct Sou	irce	1
			Utilization in	Sourcin	g Problems		Inventory		(select from dro	pdown)	Primary Original
	Mate	erial	Carbon Fiber Composite-Related	Availability	Experienced Supply		Overskih i Haik of			1	Source Country
			and/or Other Operations	is a Concern	Chain Disruptions	Quantity	Quantity Unit of Measure	Quantity in KG	Туре	Location (country)	(if known)
				is a concern	(since 2010)		ivicasarc			(country)	
	Aluminum							0			
	Ceramics & Fibers				•		,	•	•	•	•
	Silicon carbide fibers	(specify)						0			
	Abrasives	(specify)						0			
	Refractories	(specify)						0			
	Other ceramics	(specify)						0			
	Cobalt							0		<del>                                     </del>	
	Copper Gallium							0		-	
	Lead							0		-	1
	Lithium							0		-	
	Magnesium							0		-	
	Molybdenum							0			
	Nickel							0			
	Niobium							0			
	Platinum Group & Precio	ous Metals	-LL								ı
В	Palladium							0			
	Platinum							0			
	Gold							0			
	Silver							0			
	Rare Earth Elements (spe	ecify)					•				
								0			
								0			
								0			
								0			
								0			
	Steel	_									
	Alloys	(specify)						0			
	Carbon	(specify)						0			
	Stainless	(specify)						0			
	Tool	(specify)						0			
	Tantalum		-					0		<del>                                     </del>	
	Tin				-		-	0		<del>                                     </del>	1
	Titanium Tungsten							0		-	
	Vanadium							0		+	
	Zinc				1			0		<del> </del>	1
	Zirconium							0		-	
	Other	(specify)						0			
	Other	(specify)						0			
	Other	(specify)	<del>                                     </del>					0			
		(0) 00//	•				ı	-		ı	ļ
	Describe your concerns o	over availability or disr	uptions, as well as any steps your								
С	organization has taken to										
Co	omments:										
				DIJECTOR CO.	UEIDENTIAL D. C	705(4) -4:1 5 1	and December 1				
				ROSINESS COM	NFIDENTIAL - Per Section	705(a) of the Defen	ise Production Act				

escr		Se	ction 4a: Operat	ions and Challenges			
	ibe your organization's utilization rates and constraints			organization's total potential output that is actually being used in current production, where p			
	it is based on a <b>7 day-a-week, 24-hour a day productio</b>		ie iraction or an	organization's total potential output that is actually being used in current production, where p			
	100% utilization rate equals full employment with no		that necessary fo	or maintenance.			
	Estimate your organization's current utilization rate (select from dropdown)						
-	Estimate your organization's current utilization rate (select from dropdown)  Estimate your organization's current carbon fiber composite-related utilization rate (select from dropdown)						
-	· · · · · · · · · · · · · · · · · · ·						
1	f a sudden surge in customer demand occurred, estima	•	ks it would take t	to raise your organization's			
- 1-	arbon fiber composite-related utilization rate to 100%.						
	stimate the number of weeks required to increase you	r carbon fiber com	posite-related p	roduction to 150% of your			
С	urrent capacity.						
le	dentify which of the factors below would limit your org	anization's ability t	to raise your carl	oon fiber composite-related utilization rate to 100% (maximum current capacity) and to 150%			
ir	ncrease from current maximum capacity) to meet a sur	ge in demand. Pro	vide a brief desc	cription of the constraints.			
H		Sce	nario:				
	Factor	100%	150%	Description (write-in)			
2  -	Capital: Equipment, Facilities, Infrastructure	10070	130%				
H	Workforce: Labor Availability, Labor Costs						
H	Quality Control: Evaluation/Testing/Validation						
H	Inventory: Availability of Input Materials						
H	Other (specify in description)						
_							
	fy the issues that have impacted your organization's ca	irbon fiber compos	ite-related oper	ations since 2010.			
col	umn A, select YES/NO from the dropdown menu.						
	umn B, rank your top five issues (one being most impor	tant) by writing in	numbers one th	rough five using each rank exactly ence			
		, , .	numbers one th	rough live, using each rank exactly office.			
COII	umn C, provide a brief explanation of your organization	s top five issues.					
	Type of Issue	A	В	C			
		-Yes/No-	Rank Top 5	Explanation of Issue (write-in)			
_	Aging equipment, facilities, or infrastructure						
_	Domestic competition						
3 E	invironmental regulations/remediation						
4 E	xport Controls/ITAR & EAR						
5 F	oreign competition						
_	oreign competition  Sovernment purchasing volatility						
6 0							
6 0	Government purchasing volatility						
6 G 7 G 8 F	Sovernment purchasing volatility Sovernment regulatory burden Healthcare						
6 G 7 G 8 F 9 L	Sovernment purchasing volatility Sovernment regulatory burden Healthcare abor availability						
6 G 7 G 8 F 9 L 10 L	Sovernment purchasing volatility Sovernment regulatory burden Healthcare Abor availability Abor costs						
6 G 7 G 8 F 9 L 10 L	Sovernment purchasing volatility Sovernment regulatory burden dealthcare abor availability abor costs Material price volatility						
6 G 7 G 8 F 9 L 10 L 11 N	Sovernment purchasing volatility Sovernment regulatory burden dealthcare abor availability abor costs Material price volatility New production methods						
6 G 7 G 8 F 9 L 10 L 11 N 12 N	Sovernment purchasing volatility Sovernment regulatory burden tealthcare abor availability abor costs Material price volatility New production methods New products						
6 G 8 F 9 L 10 L 11 N 12 N 13 N	Sovernment purchasing volatility Sovernment regulatory burden lealthcare abor availability Adaterial price volatility lew production methods lew products Son-U.S. material availability						
6 G 8 F 9 L 10 L 11 N 12 N 13 N 14 N	Sovernment purchasing volatility Sovernment regulatory burden dealthcare abor availability abor costs Material price volatility dew production methods dew products don-U.S. material availability don-U.S. supplier reliability						
6 G 7 G 8 F 9 L 110 L 111 N 112 N 113 N 114 N 115 N 116 P	Sovernment purchasing volatility Sovernment regulatory burden dealthcare abor availability abor costs Adaterial price volatility dew production methods dew products don-U.S. material availability don-U.S. supplier reliability dension costs						
6 G 7 G 8 F 9 L 110 L 111 N 112 N 113 N 114 N 115 N 116 P	Sovernment purchasing volatility Sovernment regulatory burden dealthcare abor availability abor costs Material price volatility dew production methods dew products don-U.S. material availability don-U.S. supplier reliability						
6 G 7 G 8 F 9 L 110 L 111 N 112 N 113 N 114 N 115 N 116 P 117 P	Sovernment purchasing volatility Sovernment regulatory burden dealthcare abor availability abor costs Adaterial price volatility dew production methods dew products don-U.S. material availability don-U.S. supplier reliability dension costs						
6 G 7 G 8 F 9 L 10 L 11 N 112 N 113 N 114 N 115 N 116 P 117 P	Sovernment purchasing volatility Sovernment regulatory burden dealthcare abor availability abor costs Material price volatility dew production methods dew products don-U.S. material availability don-U.S. supplier reliability dension costs deroximity to customers						
6 G 7 G 8 F 9 L 110 L 111 N 112 N 113 N 114 N 115 N 116 P 117 P 118 P	Sovernment purchasing volatility Sovernment regulatory burden lealthcare abor availability abor costs Material price volatility lew production methods lew products Non-U.S. material availability lon-U.S. supplier reliability lension costs proximity to customers proximity to suppliers						
6 G 7 G 8 F 9 L 10 L 11 N 12 N 13 N 14 N 15 N 16 P 17 P 18 P 19 R 20 C	Sovernment purchasing volatility Government regulatory burden dealthcare abor availability abor costs Material price volatility New production methods Non-U.S. material availability Non-U.S. supplier reliability Persion costs Proximity to customers Proximity to suppliers Reduction in U.S. Government demand						
6 G 7 G 8 H 9 L 10 L 11 N 11 N 114 N 115 N 116 P 117 P 118 P 119 R 220 C 221 C	Sovernment purchasing volatility Sovernment regulatory burden dealthcare abor availability abor costs Adaterial price volatility dew production methods dew products don-U.S. material availability don-U.S. supplier reliability dension costs dension costs dension costs dension costs dension cost dension c						
6 G 7 G 8 F 9 L 10 L 11 N 12 N 13 N 14 N 15 N 16 P 17 P 18 P 19 R 20 C 21 C	Sovernment purchasing volatility Sovernment regulatory burden dealthcare abor availability abor costs Material price volatility dew production methods dew products don-U.S. material availability don-U.S. supplier reliability rension costs droximity to customers droximity to suppliers deduction in U.S. Government demand qualifications/certifications quality of inputs						
6 G 8 F 9 L 10 L 11 N 12 N 15 N 16 P 17 P 18 P 19 R 20 C 21 C 22 R 23 T	Sovernment purchasing volatility Sovernment regulatory burden dealthcare abor availability abor costs Adaterial price volatility dew production methods dew products don-U.S. material availability don-U.S. supplier reliability dension costs reoximity to customers droximity to suppliers teduction in U.S. Government demand qualifications/certifications quality of inputs decotors described as a supplier of the costs decotors described as a suppliers deduction in U.S. Government demand qualifications/certifications quality of inputs decotors described as a suppliers deduction in U.S. Government demand decotors described as a suppliers describe						
6 G 7 G 8 F 9 L 10 L 11 N 12 N 13 N 14 N 15 N 16 P 17 P 18 P 19 R 20 C 21 C 22 R 23 T 24 L	Sovernment purchasing volatility Sovernment regulatory burden lealthcare abor availability abor costs Material price volatility lew production methods lew products lon-U.S. material availability lon-U.S. supplier reliability lension costs roximity to customers roximity to suppliers leduction in U.S. Government demand qualifications/certifications quality of inputs leaces						
6 G 8 F 9 L 10 L 11 N 12 N 15 N 16 P 19 R 20 C 21 C 22 R 23 T 24 L 25 L 25 L	Sovernment purchasing volatility Government regulatory burden dealthcare abor availability abor costs Material price volatility New production methods Non-U.S. material availability Non-U.S. supplier reliability Non-U.S. supplier reliability Non-U.S. supplier reliability Non-U.S. supplier reliability Non-U.S. supplier selfability Non-U.S. supplier reliability Non-U.S. supplier reliability Non-U.S. supplier reliability Non-U.S. suppliers Non-U.S. Supplier non-U.S. Suppliers Non-U.S. Supplier non-U.S. Supplier non-U.S. Supplier non-U.S. Supplier neliability N.S. Supplier reliability						
6 G G G G G G G G G G G G G G G G G G G	Sovernment purchasing volatility Sovernment regulatory burden dealthcare abor availability abor costs Asterial price volatility New production methods New products Non-U.S. material availability Non-U.S. supplier reliability Persion costs Proximity to customers Proximity to suppliers Reduction in U.S. Government demand Qualifications/certifications Quality of inputs New D.S. material availability D.S. material availability D.S. supplier reliability Norker/skills retention						
6 G G G G G G G G G G G G G G G G G G G	Sovernment purchasing volatility Government regulatory burden dealthcare abor availability abor costs Material price volatility New production methods Non-U.S. material availability Non-U.S. supplier reliability Non-U.S. supplier reliability Non-U.S. supplier reliability Non-U.S. supplier reliability Non-U.S. supplier selfability Non-U.S. supplier reliability Non-U.S. supplier reliability Non-U.S. supplier reliability Non-U.S. suppliers Non-U.S. Supplier non-U.S. Suppliers Non-U.S. Supplier non-U.S. Supplier non-U.S. Supplier non-U.S. Supplier neliability N.S. Supplier reliability						
6 G G G G G G G G G G G G G G G G G G G	Sovernment purchasing volatility Government regulatory burden lealthcare abor availability abor costs Material price volatility lew production methods lew products lon-U.S. material availability lon-U.S. supplier reliability lension costs roximity to customers roximity to suppliers leduction in U.S. Government demand qualifications/certifications quality of inputs leases l.S. material availability J.S. supplier reliability vorker/skills retention longity lon						

Pre	vious Page							Next Page		
				Section 4b: Operation	ons and Capabilit	ties				
	Estimate the perc	centage of your organization's carbon f	iber composite-related p	roduction that occur	s within the Unit	ed States:				
Α	How many hours	does your facility operate in a typical o	day?							
	How many days p	per week does your facility typically op	erate?							
	If your organization	on produces carbon fiber fabrics, what	weaving capabilities doe	s it currently possess	5?					
		Fabric Type	Capable	Maximum Width (in)	Additional Details					
	Unidirectional									
В	Biaxial weave									
	Triaxial weave									
	Quadraxial weave									
	Braided/Tubular	Weave								
	Other	(specify)								
	Other	(specify)								
		on manufactures carbon fiber composi and the primary products manufacture	ed using these processes,			performing, the maximum di	mensions of composite parts t	hat can be produced with  Carbon Fiber Composite		
		Process	Capable	(in)	Length (in)	Product 1	Product 2	Product 3		
	Hand Lay-Up									
	Pultrusion									
С	Filament Winding									
		Placement/Tape Laying								
	Resin Transfer Mo									
	Compression Mo	lding								
	Autoclave Cure									
	Out of Autoclave	Cure								
		(specify)								
	Other	(specify)								
	Comments:									
			BUSINESS CONFID	DENTIAL - Per Section	705(d) of the De	efense Production Act				

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		Se	ction 5: Competitiveness a	nd Outlook				
and pi	rovide an explanation for each.	General areas include: busin	ess restructuring; capital ir	· · · · · · · · · · · · · · · · · · ·				
mprove	ement actions taken since 2010	).						
	Improvement Action (select	t from dropdown)	Explanation of Action (write-in)					
1	· · · · · · · · · · · · · · · · · · ·							
2								
3								
Improvement actions anticipated within the next five years.		in the next five years.						
	Improvement Action (select	t from dropdown)		Explanation of Action (write-in)				
1								
2								
3								
to change in the next five years. Provid				Comments				
Rotary-wing aircraft								
Unmanned aerial vehicles (UAVs)								
Missiles/Rockets								
Space								
Marin	e (surface and underwater)							
Trans	portation Vehicles							
Other	(specify here)							
	· · · · ·							
Other	(specify here)							
		Current Participation	Expected Change	Comments				
	· -							
	, ,							
	•							
	•							
	(specify here)							
Other	(specify here)							
	mprove  1 2 3 mmprove  1 2 3 mmprove  1 2 3 from the o chan Missil Space Marin Trans Other Unma Space Marin Trans Constitution	and provide an explanation for each eting improvements; staff adjustment improvement actions taken since 2010  Improvement Action (select 1 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ts A and B, identify three key actions your organization has taken of and provide an explanation for each. General areas include: busine teing improvements; staff adjustments; and quality control improvement provement actions taken since 2010.  Improvement Action (select from dropdown)  Improvement actions anticipated within the next five years.  Improvement Action (select from dropdown)  Improvement Action (select from dropdown)  Cumprovement Action (select from dropdown)  Curprovement Action (select	Improvement Action (select from dropdown)  Improvement Action (selec				

Prev	ious Page			Next Page						
	Section 6a: L	J.S. Government and	DOD Participation							
	Occupied of a 5 /a constitution of a 5 /a con	Type of 0	Operation							
	On a scale of 1-5 (1 = not dependent; 5 = highly dependent), specify the dependency of your organization on:	Carbon Fiber Composite-Related	All Other Operations	Provide a brief explanation (write-in)						
Α	U.S. Government defense demand									
	U.S. Government non-defense demand									
	Commercial demand									
	Note: For the purposes of this survey, U.S. Government defense sale (such as sales through a prime contractor). All sales with governmen									
	Estimate the percentage of your U.S. Government defense carbon filbusiness lines. (select from dropdown)	per composite-related	business lines that are	e readily convertible tocommercial						
В	business lines. (select from dropdown)									
	Does your organization consider itself dependent upon current U.S. Explain your response below.	Government defense	programs for its contin	nued viability?						
				•						
	From the list below, select the likely impacts that a sudden change in direct and/or indirect U.S. Government defense demand would have on your organization and provide an explanation where applicable:									
	Business Operation	Impact of sudden DECREASE in USG Defense Demand	Impact of sudden INCREASE in USG Defense Demand	Explanation						
	Capital Expenditures									
	Research & Development Expenditures									
	Participation in USG Contracts									
	Product/Service Costs									
С	Organization Viability/Solvency									
	Personnel with Key Skills									
	Number of Product/Service Lines									
	Pursuit of Non-U.S. Customers									
	Level of Key Production Equipment									
	Movement of Operations to Non-U.S. Locations									
	Other (specify)									
	Other (specify)									
D	Since 2010, has your organization received a rated order (DO or DX) means a prime contract, a subcontract, or a purchase order in suppo Defense Priorities and Allocation System (DPAS) regulations (15 CFR	ort of an approved pro								
Co	mments:									
	BUSINESS CONFIDENTIAL	- Per Section 705(d)	of the Defense Produ	ction Act						

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Previo	ous Pag	<u>38</u>		Sacti	on 6b: U.S. Government and D	OD Participation			Next Page
Α		e 2010, has your organization directly on proceed to section 7. If yes, complet				OD Faiticipation			
		n the list of U.S. government agencies cate the type of support provided (carb				ency, identify it in an "Other" b	ox.		
	U.S.	Air Force		U.S. Intelligence Community	(such as CIA, NGA, NRO, NSA)		Department of Energy (DOE)		
В	U.S.	Army		Missile Defense Agency (MDA	A)		Defense Logistics Agency (DL		
	U.S.	Marine Corps		National Aeronautics & Space	National Aeronautics & Space Administration (NASA)		Other	(specify here)	
	U.S.	Navy		National Oceanic & Atmosphe	eric Administration (NOAA)		Other	(specify here)	
	In the CARBON FIBER COMPOSITE-RELATED PRODUCT columns, select the specific carbon fiber composite-related products your organization provides in support of the specific program/system. If applicable, select anon-carbon FIBER COMPOSITE PRODUCT as well. The dropdown options for these columns are based on the products identified in Section 2. If additional products are provided in support of a specific government program/system, repeat the program/system on a new row and select the remaining products.  NOTE: If your organization is unsure of the specific GOVERNMENT PROGRAM/SYSTEM NAME or AGENCY NAME, provide as much information as possible.								
		Government Program/System Name (write-in)	Agency Name (select from dropdown)	Carbon Fiber Composite- Related Product 1 (select from dropdown)	Carbon Fiber Composite- Related Product 2 (select from dropdown)	Carbon Fiber Composite- Related Product 3 (select from dropdown)	Carbon Fiber Composite- Related Product 4 (select from dropdown)	Carbon Fiber Composite- Related Product 5 (select from dropdown)	Other Product (select from dropdown)
	1								
	2								
	3								
	4								
	5								
С	6								
	7								
	8								
	9								
	10								
	12								
	13								
	14								
	15								
	16								
	17								
	18								
	19								
	20								
Con	nments	s:							
				BUSINESS CONFIL	DENTIAL - Per Section 705(d) of	the Defense Production Act			

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Previous Page										Next Page	
Provide your U.S. operation's 2010-2013 U.S. and non-U.S. sales infor 2 (should sum to 100%). In part B, provide your organization's total <b>c</b> estimate the percentage change in total sales and carbon fiber compositions.	arbon fiber	all products. In composite-rela	ated sales a	vide your organ				-			
*Government sales include direct sales to government customers and reported as government sales.					_	·	·	·			
Note: Ensure your Source of Sales Data is consistent with your respo Unit/Division-level data.  Source of Sales Data:  Reporting Schedule:	nse in section	on 1a. If you ha	ive declared	this to be a Bu	isiness Unit	/Division-level	response, ti	his section shou	ild contain B	usiness	
"U.S." means U.S. domestic sales; "Non-U.S." means only export		Record in \$ Thousands, e.g. \$12,000.00 = survey input \$12							Record as Percent Change from 2013		
sales from U.S. locations	U.S.	010 Non-U.S.	U.S.	011 Non-U.S.	U.S.	Non-U.S.	2 	2013 Non-U.S.	U.S.	Non-U.S.	
A Total Sales, all Customers (in \$)											
1 Total Non-Government Sales [as a % of line A]											
2 *Total Government Sales [as a % of line A]											
Lines 1 & 2 must sum to 100%	0%	0%	0%	0%	0%	0%	0%	0%			
Total Carbon Fiber Composite-Related Sales (in \$)											
Carbon Fiber Composite-Related Non-Government Sales [as a % of line B]											
*Carbon Fiber Composite-Related Government Sales [as a % of line B]											
Lines 1 & 2 must sum to 100%	0%	0%	0%	0%	0%	0%	0%	0%			
*Carbon Fiber Composite-Related U.S. Government  Defense Sales [as a % of line B]  *Carbon Fiber Composite-Related U.S. Government, Non-		-		-		-		-			
*Government sales include direct sales to government customers and All sales with government end uses should be reported as government		les to governm	ent custom	ers (such as sal	es through	a prime contra	ctor).				

Comments:

Prev	ious Pa	age_							Next Page
						Section 8: Customers			
		ify your leading direct customers for a COMPOSITE-RELATED SALES 2010-2						location (City, State, Country). Estima	te the AVERAGE ANNUAL CARBON
		Direct Customer Name	City	State	Country	Average Annual Sales 2010-2013 to Customer (in \$1,000's)	Carbon Fiber Composite-Related Product Provided 1	Carbon Fiber Composite-Related Product Provided 2	Carbon Fiber Composite-Related Product Provided 3
	1								
	2								
	3								
	4								
Α	5								
	7								
	8								
	9								
	10								
	11								
	12								
	13								
	14								
	15								
	Comm	ents:							
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<u>Previous Page</u>	Next Page
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# **Section 9: Financials**

Report line items from your organization's financial statement for years 2010-2013. From the drop-down indicate whether the reported income statement and balance sheet line items are Business Unit/Division or Corporate/Whole Organization financials.

Note: Ensure your Source of Financial Line Items is consistent with your response in section 1a. This means if you have declared this to be a Business Unit/Division-level response, this section should contain Business Unit/Division-level data.

	Source of Financial Line Items	:							
	Reporting Schedule:								
	Income Statement (Select Line Items)	Record in \$ Thousands, e.g. \$12,000.00 = survey input of \$12							
	Income Statement (Select Line Items)	2010	2011	2012	2013				
Α	Net Sales (and other revenue)								
В	Cost of Goods Sold								
С	Total Operating Income (Loss)								
D	Earnings Before Interest and Taxes								
Ε	Net Income								
	Deleves Chest (Calest Live Itams)	Record in \$ Thousands, e.g. \$12,000.00 = survey input of \$12							
	Balance Sheet (Select Line Items)	2010	2011	2012	2013				
Α	Cash								
В	Inventories								
С	Current Assets								
D	Total Assets								
Е	Current Liabilities								
F	Total Liabilities								
G	Retained Earnings								
Н	Total Owner's Equity*								
*T	otal Owner's Equity should equal Total Asse	ets minus Total Lial	oilities						
	Comments:								
	BUSINESS CONFIDENTIAL	- Per Section 705(	d) of the Defense P	Production Act					

eviou	us Page					<u>Nex</u>
		Section   Sectio	on 10: Workforce used operations for the	2010-2013 period. The	n, estimate the percent	age of these
	·	who may perform cross-operational roles. Estin		e declared this to be a E	Business Unit/Division-le	evel response, th
ction		s Unit/Division-level data.				
		ce of Workforce Data:				
_	R	eporting Schedule:				
		Professional Occupations	2010	2011	2012	2013
1	1 Total Full Time Equiva	` ' ' '				
		lanagement, & Legal Staff [as a % of 1]				
		ists, and R&D Staff [as a % of 1]				
		nance Staff [as a % of 1]				
	e Marketing & Sale	nology Professionals [as a % of 1]				
	f Production Line V	•				
		s, Quality Control, and Support Technicians [as				
	h Other (specify)					
	i Other (specify)					
	Lines a through i mus	t total 100%	0%	0%	0%	0%
2	)	age of your total FTEs that worked on <b>CARBON ELATED</b> business lines:				
	, ,	eve difficulty hiring and/or retaining any parts of pations and provide an explanation.	your workforce?			
		Occupation	Difficulty		Explanation	
_	ngineers, Scientists, and					
In	nformation Technology F	Professionals				
Pı	roduction Line Workers					
-		y Control, and Support Technicians				
_	Other (specify)	(specify)				
0	Other (specify)	(specify)				
		n fiber composite-related skills and/or competer p-down menu then describe it in the right hand		to your organization. Id	dentify the general type	of skill and/or
	1	Type of Skill or Competency		Explar	nation	
1	1					
	2					
	3 4					
	5					

<u>Previous Page</u> <u>Next Page</u>

# **Section 11: Research and Development**

Report your organization's total research and development (R&D) dollar expenditures for the years 2010 to 2013. In addition, estimate the percentage of total R&D expenditures related to carbon fiber composite-related business lines and defense business lines. Next, detail the source of your organization's R&D funds.

Note: Ensure your Source of R&D Reporting is consistent with your response in section 1a. If you have declared this to be a Business Unit/Division-level response, this section should contain Business Unit/Division-level data.

R&D Data Schedule:							
DOD Formers likeways	Record in \$ Thousands, e.g. \$12,000.00 = survey input of \$12						
R&D Expenditures	2010	2011	2012	2013			
A Total R&D Expenditures							
1 Basic Research [as a % of A]							
2 Applied Research [as a % of A]							
3 Product/Process Development [as a % of A]							
Lines 1 through 3 must sum to 100%	0%	0%	0%	0%			
4 Carbon Fiber Composite-Related R&D Expenditures [as a % of A]							
5 All Defense-Related R&D Expenditures [as a % of A]							
R&D Funding Sources	Record in	\$ Thousands, e.g. \$1	.2,000.00 = survey inp	out of \$12			
R&D Fullding Sources	2010	2011	2012	2013			
B Total R&D Funding Sources							
1 Internal/Self-Funded/IRAD [as a % of B]							
2 Total Federal Government [as a % of B]							
3 Total State and Local Government [as a % of B]							
4 Universities - Public and Private [as a % of B]							
5 U.S. Industry, Venture Capital, Non-Profit [as a % of B]							
6 Non-U.S. Investors [as a % of B]							
7 Other (specify)							
Lines 1 through 7 must sum to 100%	0%	0%	0%	0%			
Please provide a brief description of your organization's carbon fiber composite-							
related R&D activities.							
Comments:							

<u>Previous Page</u>				Next Page		
Section 12: C	Capital Expenditures					
Record your organization's capital expenditures corresponding to the select categories below.						
Note: Ensure your Source of Capital Expenditure Data is consistent with y Unit/Division-level response, this section should contain Business Unit/D	•	1 1a. If you have de	clared this to be a B	Business		
Source of Capital Expenditure Data:						
Capital Expenditure Reporting Schedule:						
	Record in \$	Record in \$ Thousands, e.g. \$12,000.00 = survey input of \$12				
Capital Expenditure Category	2010	2011	2012	2013		
A   Total Capital Expenditures						
1 Machinery, Equipment, and Vehicles [as a % of A]						
2 IT, Computers, Software [as a % of A]						
3 Land, Buildings, and Leasehold Improvements [as a % of A]						
4 Other (specify)						
5 Other (specify)						
Lines 1 through 5 must total 100%	0%	0%	0%	0%		
6 Carbon fiber composite-related capital expenditures [as a % of A]						
From 2010-2013, were your organization's capital expenditures adversely impacted by reductions in U.S.  Government defense spending, or do you anticipate them to be in the future?  Explain your response below.						
Identify any unique or critical equipment, infrastructure, and/or facilities owned and/or operated by your organization for <b>carbon fiber</b> or <b>related</b> applications. Provide a brief description of each.						
Type of Equipment, Infrastructure, or Facility	Type of Equipment, Infrastructure, or Facility  Description					
C 1						
2						
3						
5						
3						
Comments:						
BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act						

Pre	<u>evious Page</u>		Next Page			
	Section	n 13a: U.S. Government Outreach				
	There are many federal and state government programs and services available	e to assist your organization to better compete in the global marketplace.				
	If you would like more information regarding these U.S. Government programs, select the specific areas of interest below.					
	The Commerce Department will follow-up with your organization regarding your selections.					
А	Business development (joint ventures, new markets, etc.)	Patents and trademarks	ļ			
	Energy and environmentally conscious manufacturing	Product/service development (including manufacturing standards, processes, and practices)				
	Export licensing (ITAR/EAR)	R&D programs				
	Financing (access to capital, loans, etc.)	Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) contracts				
	Global export opportunities	Training Opportunities				
	Government procurement guidelines and e-commerce	Country Commercial Guides (specify countries in box)				
	Manufacturing technology development (including acquiring, licensing, and/or commercializing federally developed technologies)	Other (specify)				
	Marketing assessment skills	Other (specify)				
Co	Comments:					
	BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act					

Previous Page	Table of Contents				
Section 13b: Certification					
The undersigned certifies that the information herein supplied in response to this questionnaire is complete and correct to the best of his/her knowledge. It is a criminal offense to willfully make a false statement or representation to any department or agency of the United States Government as to any matter within its jurisdiction (18 U.S.C.A. 1001 (1984 & SUPP. 1197)).					
Organization Name:					
Organization's Internet Address:					
Name of Authorizing Official:					
Title of Authorizing Official:					
E-mail Address:					
Phone Number and Extension:					
Date Certified:					
In the box below, provide any additional comments or any other information you wish to include regarding this survey assessment.					
How many hours did it take to complete this survey?					
BUSINESS CONFIDENTIAL - Per Section 705(d) of the Defense Production Act					