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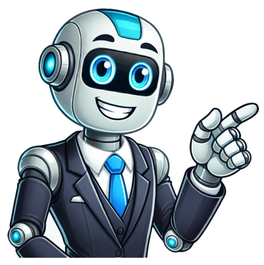

LIGHT WEIGHT CARBON FIBER FABRIC Woven carbon fiber fabrics can be used in wet lay-up or vacuum bagged where strength and stiffness are important. Values shown are based on typical fiber data and should be used as a guide, not a specification.CST Item #WeightTow Size Tow Count/InchWeaveThickness(oz./sq. yd.)(Inches)CF10X21k13 x 13Plain0.004CF11X1.81k 11.6 x 11.6 Plain0.004CF13X2.941k19 x 19 Plain0.007CF131-503.0312k45 BiasStitched0.006CF14X3.51k24 x 24 Plain0.007CX15X5.73k12 x 12 Plain0.012CFT15X5.93k13 x 13 Twill0.012CF19X10.96k12 x 12 5 Hs0.024 ULTRA LIGHT SPREAD TOW CARBON FIBER FABRIC, 2.0 oz./sq. yd., 39.37" wide Item #: CF111 Plain WeaveSpread Tow Thread Count0.004" Thick 1K Tow Sold By The Linear Foot LIGHT WEIGHT CARBON FIBER FABRIC, 2.0 oz./sq. yd., 39.37" wide Item #: CF10 Plain Weave13 X 13 Thread Count0.004" Thick1k Tow Sold By The Linear Foot LIGHT WEIGHT CARBON FIBER FABRIC, 2.9 oz./sq. yd., 39.37" wide Item #: CF13 Plain Weave19 X 19 Thread Count0.007" Thick1k Tow Sold By The Linear Foot LIGHT WEIGHT CARBON FIBER FABRIC, 3.5 oz./sq. yd., 42" wide Item #: CF14 Plain Weave24 X 24 Thread Count0.007" Thick1k Tow Sold By The Linear Foot Carbon Fiber Fabric 5.7 oz., 50" wide, Plain Weave. Item #: CF-155-50 M Plain Weave12X12 Thread Count0.012" Thick3K Tow, Sold By The Linear Foot. CARBON FIBER FABRIC, 5.9 oz./sq. yd., 50" wide, Twill Item #: CF-156T-50 M Twill Weave13 X 13 Thread Count0.012" Thick3k Tow Sold By The Linear Foot Carbon fiber Fabric 19.75 oz., 2x2 Twill Weave, 50" Wide, Style 94940. Item #: CF-94940-50 M Twill Weave10.7 X 10.0 Thread Count0.039" Thick12k Tow Sold By The Linear Foot BIAS CUT CARBON FIBER FABRIC We are providing 2.4 oz. and 2.9 oz. carbon fabrics with a bias cut option. The illustration below will give you a visual on how we do this. The result is a parallelogram. If you order a 1-foot piece, the short side will measure 12 inches and the long side 55 inches. The most critical dimension is the 8.25 inches perpendicular to the 55 inch cut edge.Model aircraft builders typically use this cut on the leading edge of their wings to carry torsion loads. To create a d-box, wrap the bias cut carbon from the top of the spar, around the leading edge to the bottom of the spar. The spar acts to close the d-box. To determine the amount you need to order, measure the distance around the leading edge and divide by 8.25". Round up to the next whole number and order that many feet. For example: If you measure 7" and you are making two wing d-boxes, divide 14" by 8.25" = 1.7 or 2 feet. You will receive a piece 24" on the short side, 55" on the long side and 16.5" perpendicular to the long side. See the diagram below: Carbon Fiber Fabric, 2.9 oz., Bias Cut Item #: CF-135B-39 M 39.3" WidePrice per foot, all quantities $127.64 2024 CST The Composite Store, Inc. Policies Carbon fiber is an incredible material with unique qualities that make it ideal for some product applications. Its exceptionally strong and lightweight, is highly wear resistant and extremely durable. Its radiolucent properties make it a great fit for radiology products and its thermal conductivity is critical to many applications.Shop for carbon fiber online and youll find carbon fiber sheets in a wide range of materials and price points. In this article, well help you break the code and understand what factors are driving the cost when youre buying carbon fiber.Basic Material CostsCarbon fiber sheets and parts are made up of two materials carbon fiber (fabric or tows) and resin (often epoxy).Factors that influence price include:1) sheet thickness2) fabric weight (3k, 6k, 12k)3) fabric layup and4) manufacturing method.Lets break them down and how each one affects cost.1. Sheet ThicknessAside from sheet size, sheet thickness is a key factor in determining price. The thickness of the sheet is based on the number layers of fabric in the sheet. For example, a sheet is 16 layers of 6k fabric infused with resin. The more layers of fabric required to build thickness, the higher the cost.Also, its important to note that if youre replacing an 1/8 sheet of wood, aluminum or steel with carbon fiber, you wont need an 1/8 thick piece of carbon fiber. Talk to your supplier for advice to determine what thickness makes most sense.2. Fabric and Fabric WeightFabric weight has a significant affect on price:6k fabric is considered a mid-range fabric thickness and very common in the industry. Its practical and easy to work with and cost effective for many applications.A 3k fabric is a smaller, finer, lighter weight weave. Its especially useful for molds with tight corners and applications that require a lighter weight fabric. However, because its lighter, it will require more layers of fabric to achieve the same panel thickness as a 6k, making it more expensive to produce. It will also yield a stronger, more rigid product.12k fabric is also an option, though a little less common. It can be a more cost effective option compared to 3k or 6k fabric. A 12k weave has larger tows (think burlap vs. cotton), so it takes fewer layers of fabric to create a thick panel. If you dont mind the larger weave, buying carbon fiber sheets made of 12k may help you save money. Some customers find it more challenging to get a clean edge when cutting it, though its totally possible with the right tools and machine speeds.Use of specialty fabrics like unidirectional weaves, harness weaves or specialty patterns will also have a significant influence on the price.True aerospace grade fabric can be significantly more expensive than industrial quality carbon fiber and offers no noticeable additional benefit for most customers. However, some companies use the term aerospace grade purely for marketing purposes. If you require certified aerospace grade material, you can expect to pay a premium for it.3. Fabric LayupFabric layup will also influence the cost of a carbon fiber sheet. A standard layup is a 0/90, where each layer of fabric is laid on top of the next at a 90-degree angle. Customers with specific strength requirements may require a quasi-isotropic layup or a special combination of layered materials to provide the material qualities they need. Layering in fiberglass, kevlar, basalt and other products can be another way to trim costs depending on your strength and performance needs.4. Manufacturing MethodA wet layup is the least expensive way to make a carbon fiber sheet and is a common method used by DIY makers because of its relative simplicity. On the downside, this process can be imperfect and messy and result in inconsistent product and/or sheets with pinholes.Vacuum infusion is a more complex process, creating carbon fiber sheets that are much more consistent in quality and less prone to air pockets or pinholes. In this case, dry fabric is laid on infusion tables, placed under a vacuum bag and infused with resin.A hot press is also a common way to manufacture carbon fiber sheets. This process uses prepreg carbon fiber fabric which is coated in resin during the manufacturing process. The sheets are loaded into a press under heat and very high pressure. In many cases, hot press carbon fiber sheets are less expensive than those made through vacuum infusion. However, there are size and shape limitations with this method.Resins also deserve a quick note as they also play a role in the cost of a carbon fiber sheet. Vinyl ester and polyester resins are generally the least expensive. Theyre easy to use and have good mechanical properties. Epoxy resins are industry standard with excellent mechanical properties and provide higher strength and temperature resistance, though at a slightly higher price. High temp resins and other specialty resins are premium products that command higher prices.Pinholes and Porosity How Much Do They Matter?It really depends on your application. Cosmetically, these voids will show up as tiny pinholes or air pockets. Materially, porosity compromises the structural integrity and long-term durability of the carbon fiber. However, if uncompromising strength isnt absolutely critical and perfect appearance doesnt matter, a carbon fiber sheet with pinholes may be totally fine for your needs. In many cases, an automotive clear coat can be applied to the surface to fill in voids for cosmetic purposes.If this sounds like you, you may want to check out our Scrap Packs in lb. or 1 lb. sizes where we sell slightly imperfect carbon fiber. If you have a specific size or thickness in mind, give us a call and well see what we have available.How Do You Decide Whats Right For You?Everything depends on your application. When were working with customers, here are the questions we ask:How strong does it need to be? Will a standard 0/90 layup meet your needs or is it worth spending more money on specialty materials or layup to insure the material is strong enough to handle to the load?How important are cosmetics? Do pinholes matter? If youre looking for perfection, find a company that uses vacuum infusion manufacturing process. (I happen to know one called Protech Composites.) If pinholes or cosmetics dont matter, a hot press sheet may be cheaper and fine for your needs.You can also save money by a carbon fiber sheet made of 12k. The trade-off? The weave will be larger and material may be just a little more challenging to cut. This one is purely a personal preference. Some dislike 12k, some never notice the difference.Finally, if you see a carbon fiber sheet for a price thats so low you cant believe, its probably not 100% carbon fiber. Sometimes off-shore manufacturers will place cheap black plastic filler between layers of carbon fiber. If it meets your need, you dont need 100% carbon fiber and the price is right, maybe you buy it anyway. Just consider yourself warned that it might not be whats advertised!Final Tips for Cost OptimizationNo doubt, carbon fiber is an expensive material but there are ways to manage your costs. Your supplier is your best resource to help you determine whether carbon fiber is a good fit and how to optimize your spend and determine the most cost-efficient way to meet the needs of your application. A good supplier will talk you through your cost alternatives and explain the pros and cons of each. In some cases, they can recommend alternative fabrics or layups that can save you money. Also, ask for a quote with volume breaks to understand your options there as well.We hope this was helpful. If youre thinking about using carbon fiber, get in touch and we can talk about the possibilities. Well be happy to walk you through the process and provide a quote with your options. ADDITIONAL INFORMATIONCarbon fiber (carbon fibre), alternatively graphite fiber, carbon graphite or CF, is a material consisting of extremely thin fibers about 0.005-0.010 mm in diameter and made primarily of carbon atoms. The carbon atoms are bonded together in microscopic crystals that are more or less aligned parallel to the long axis of the fiber. The crystal alignment makes the fiber very strong for its size. Several thousand carbon fibers are twisted together to form a yarn, which may be used solely or woven into a fabric. Carbon fiber has lots of different weave patterns and can be combined with a plastic resin and wound or molded to create composite materials such as CFRP to yield a high strength-to-weight ratio material. The density of carbon fiber is also considerably lower than the density of steel, making it ideal for applications requiring low weight. The properties of carbon fiber such as low weight, high tensile strength, and low thermal expansion make it the material of choice in aerospace, military, civil engineering, and motorsports, along with other competition sports. However, it is to some extent expensive when compared to similar materials such as fiberglass or plastic. Carbon fiber is very strong when stretched or in tension, but not impressive when compressed or exposed to high shock (for example a carbon fiber bar is highly difficult to bend, but will crack easily if hit with a tool).In 1958, Roger Bacon created high-performance carbon fibers at the Union Carbide Parma Technical Center, found outside of Cleveland, Ohio. Those fibers were made by heating strands of rayon until they carbonized. This process turned out to be inefficient, as the resulting fibers had only about 20 percentcarbon and had stiffness and low strength properties. In the early 1960s, a process was invented by Dr. Akio Shindo at Agency of Industrial Science and Technology of Japan, utilizing polyacrylonitrile (PAN) as a raw material. This produced a carbon fiber that contained about fifty five percent carbon.The potential for high strength of carbon fiber was observed in 1963 in a process developed at the Royal Aircraft Establishment at Farnborough, Hampshire. The program was patented by the UK Ministry of Defense and licensed to 3 British companies: Rolls-Royce, already making carbon fiber, Morganite & Courtaulds. They were able to create industrial carbon fiber manufacturing facilities within a few years, and Rolls-Royce took advantage of the new materials properties to make a place in the American market with its RB-211 aero-engine.Even then, though, there was public concern over the ability of British industries to make the best of this breakthrough. In 1969 a House of Commons select committee inquiry into carbon fiber, asked: How then is the nation to reap the maximum benefit without it becoming yet another British invention to be exploited more successfully overseas? Eventually, this concern was justified. One after another the licensees ended carbon fiber production. Rolls-Royces interest was in state-of-the-art aero-engine applications. Its own production program was to let it to be leader in the use of carbon-fiber reinforced plastics. In-house manufacturing would likely stop once reliable commercial sources became possible.Sadly, Rolls-Royce pushed the the best technology too far, too quickly, in using carbon fiber in the engines compressor blades, which proved vulnerable to damage from bird impact. What seemed a great British technological triumph in 1968 quickly became a disaster as Rolls-Royces ambitious schedule for the RB-211 was endangered. Rolls-Royces problems became so great that the company was finally nationalized by Edward Heaths Conservative government in 1971 and the carbon fiber production plant sold to form Bristol Composites.Given the limited market for a very pricey product of variable quality, Morganite also decided that carbon fiber manufacturing was peripheral to its core business, leaving Courtaulds as the only big UK manufacturer.The company continued making carbon fiber, developing two main markets: aerospace and sports equipment. The speed of manufacture and the quality of the product were improved.During the 70s, experimental work to find alternative raw materials led to the introduction of carbon fibers made from a petroleum pitch derived from oil processing. These fibers contained about 85% carbon and had excellent flexural strength.During the 1980s Courtaulds continued to be a major supplier of carbon fiber for the sporting goods markets, with Mitsubishi its main customer. Unfortunately, a move to expand, including building a manufacture plant in California, turned out poorly. The investment didnt generate the anticipated returns, leading to a decision to pull out of the area. Courtaulds ceased carbon fiber production in 1991, though ironically the one surviving UK carbon-fiber manufacturer continued to thrive making fiber based on Courtauldss precursor. Inverness-based RK Carbon Fibres Ltd has concentrated on manufacturing carbon fiber for industrial applications, and thus does not need to compete at the quality levels reached by overseas producers.Each carbon filament thread is a bundle of many thousand carbon fibers. One filament is a thin tube with a diameter of 5-8 micrometers and consists almost exclusively of carbon. The earliest generation of carbon fibers (i.e., T300, and AS4) had diameters of 7-8 micrometers. Later fibers (i.e., IM6) have diameters that are approximately 5 micrometers.Precursors for carbon fibers are rayon, polyacrylonitrile (PAN) and pitch. Carbon fiber filament yarns are used in several manufacturing processes: the direct uses are for prepregging, pultrusion, filament winding, weaving, braiding, etc. Carbon fiber yarn is rated by the linear density (weight per unit length, i.e. 1 g/1000 m = 1 tex) or by number of filaments per yarn count, in thousands. For example, 200 tex for 3,000 filaments of carbon fiber is three times as strong as 1,000 carbon fibers, but is also three times as heavy. This count is usually expressed as 3K, 12K, 6K, etc. This thread can then be used to weave a carbon fiber filament fabric or cloth. The appearance of this fabric generally depends on the linear density of the yarn and the weave chosen. Some commonly used types of weave are plain, 22 twill, 44 twill and satin.A common method of manufacture involves heating the spun PAN filaments to approximately 300 C in air, which breaks many of the hydrogen bonds and oxidizes the material. The oxidized PAN is then put into an oven having an inert atmosphere of a gas such as argon, and heated to approximately 2000 C, which induces graphitization of the material, altering the molecular bond structure. When heated in the correct conditions, these chains bond side-to-side (ladder polymers), creating narrow graphene sheets which finally merge to form a single, columnar filament. The result is usually 93-95% carbon. Low quality carbon fiber can be produced using pitch or rayon as the precursor instead of PAN. The carbon can become further enhanced, as high modulus, or high strength carbon, by heat treatment processes. Carbon heated in the range of 1500-2000 C (carbonization) exhibits the highest tensile strength (820,000 psi, 5,650 MPa or N/mm), while carbon fiber heated from 2500 to 3000 C (graphitizing) exhibits a higher modulus of elasticity (77,000,000 psi or 531 GPa or 531 kN/mm). Heavy duty plain weave. 12K Tow Size for fast buildup. Very conformable for a 12K fabric. Thread count: 5 Picks x 5 Picks per inch Good openness to the weave for easy resin saturation. Only available until we run out. Toray Industries:Toray Industries is a global leader in high-performance materials like carbon fiber, synthetic fibers, and chemicals. Known for strong R&D and innovation, it serves aerospace, automotive, electronics, and medical industries with reliable quality and a solid supply chain.Teijin Limited:Teijin Limited is a Japan-based global company specializing in high-performance fibers like carbon and aramid, plastics, electronics, healthcare, and energy solutions. Known for strong R&D, it leads in carbon fiber composites used in aerospace, automotive, and sports. The company focuses on sustainability and innovation, recognized as an industry technology leader.DanyangNQGlassFiberWeavingCo.,Ltd.Danyang NQ Glass Fiber Weaving Co., Ltd., founded in 2007 in Jiangsu, China, specializes in alkali-resistant fiberglass mesh, reinforcement mesh, self-adhesive tape, and screening mesh. With a 7 million sqm annual capacity, ISO9001 certification, and strict quality control, it serves construction and industrial markets worldwide, earning a strong reputation for quality and customer service.SolvayA technology company that provides solutions for materials, chemicals, and carbon fiber cloth to bring technological advancements and address key industrial, social, and environmental challenges faced by many fields such as aviation, automotive, electronics, healthcare, water treatment, and air management.SGL Carbon:SGL Carbon, based in Germany, is a global leader in carbon materials, including carbon fibers, composites, and graphite products. Serving automotive, aerospace, energy, and industrial sectors, it offers high-performance, heat- and corrosion-resistant solutions. Known for innovation and sustainability, SGL holds top positions in carbon fiber composites and graphite electrodes.Hexcel Corporation:Hexcel Corporation is a leading U.S.-based composite materials manufacturer specializing in carbon fiber, prepregs, and resins. Their products serve aerospace, defense, and industrial markets. Hexcel supplies key materials to Boeing, Airbus, and others, with global manufacturing sites and strong R&D capabilities. The company drives technological innovation and sustainability, making it a major supplier in the industry.Hyosung Corporation:Hyosung Corporation is a South Korean global conglomerate founded in 1966, specializing in textiles, chemicals, heavy industry, energy, and IT. Known for sustainable brands like CREORA, it excels in energy systems and polymer production. With operations in over 60 countries, Hyosung focuses on innovation and strong ESG practices to drive sustainable growth and global leadership.Zoltek Companies, Inc.:Zoltek Companies, Inc., part of Toray Industries, is a global leader in industrial carbon fiber production. It offers cost-effective Panex fiber, flame-resistant Pyron, and recycled carbon fiber. With plants in the US, Hungary, and Mexico, Zoltek serves wind energy, automotive, and marine industries. Its strengths include high production capacity, competitive pricing, and versatile applications.Formosa PlasticsFormosa Plastics is a major Taiwanese company specializing in petrochemicals, plastics, and synthetic resins. It produces PVC, polyethylene, and other polymers for industries like construction, packaging, and electronics. Known for large-scale, efficient production and strong R&D, Formosa Plastics emphasizes sustainability and global market presence, making it a key player in the chemical sector.Nippon Graphite Fiber Co., Ltd.Nippon Graphite Fiber Co., Ltd., a subsidiary of Mitsubishi Chemical, specializes in high-performance carbon fiber for aerospace, defense, and industrial applications. Its flagship product, DIALEAD, offers ultra-high modulus and strength. The company is known for precision manufacturing, advanced R&D, and reliable quality, making it a trusted supplier in demanding global markets.These are essential for anyone handlingcarbon fiber fabric! They trend quality, supply and new applications. Their worldwide footprint translates into cutting-edge technology, expanded options and reliable availabilitywherever youre located. Image not available forColor: To view this video download Flash Player We are the premiere cut yardagedistributor.All of our carbon fabric is manufactured in the United States.By purchasing from LeapTech Composites, you can rest assured that not only will you be getting the best, high quality American madeadvanced composite materials available; but you are helping to create jobs that support the families ofAmerican workers.We have all of our composite fabric materials and carbon fiber cloth for salein both cut yardage and full roll quantities. The price listed is from the lowest price break. To check pricing for the quantity you are interested in, just click the product picture or name and it will bring up product details, specifications, and price breaks.All fabric orders less than 5 yards will come folded. If you wish to have your order of less than five yards rolled, there will be an additional shipping charge. Please let us know if you would like to have your fabric rolled when your order is placed.

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