Trade Mission to Japan

PLUS
Pat McCarthy
Flexible Strength

How a young entrepreneur is taking the world of carbon fiber in a new direction.

Brian Mittge

Carbitex founder and chairman Junus Khan took the old story of tinkering in a garage and brought it into the carbon fiber future — his company’s flexible materials are revolutionizing the shoe industry, and he’s just getting started. Hear his story of entrepreneurship, including building his manufacturing facility from off-the-shelf parts, in this latest edition of How I Did It.

Background

**THE JOB:**
Founder and chairman of Richland-based Carbitex

**ORIGINALLY FROM:**
New Jersey

**EDUCATION:**
Rutgers University

**NEXT STEP:**
After a brief experience working in finance, went to work in the auto industry, gaining experience in manufacturing and in high-end auto events.

**SECOND ACT:**
While living in Richland and working for a Swedish-based “supercar” manufacturer, he began tinkering in his garage. The flexible carbon fiber he developed became the basis of Carbitex.

**WHAT’S NEXT:**
Since late last summer, Khan has been based in Hong Kong, to be closer to his customers in the footwear industry

Carbitex:
www.carbitex.com

“The premise essentially was, carbon fiber is this advanced material, it’s still new. I think we can harness its properties in a different way. Let me just try to prove that.”

— Junus Khan, Founder and chairman, Carbitex

With his startup company’s first major order finally signed — for several thousand sheets of high-tech flexible carbon fiber due for delivery in three months — Junus Khan looked out over his large new factory floor.

It was completely empty.

No machines, no product lines, nothing.

Working nights and weekends, he and his core team quickly built their manufacturing equipment and process from scratch, using off-the-shelf parts. Their three-person team made the delivery date.

At dinner with the customer representative to celebrate, Khan showed him a picture of what their factory floor had looked like just three months before. The rep’s jaw dropped, and his eyes widened.

Khan asked what he would have said if he knew about that when the company made the order. “There would have been no order to place,” the rep said.

That customer is still with the firm, along with global customers who make cutting-edge products from the unique material created by Carbitex and its 36-year-old founder.
Khan spoke to Washington Business by phone from Hong Kong, where he has been based since last August, to be closer to his customer base in athletic shoe manufacturing.

He talked about his unconventional route to manufacturing, what Lamborghinis have to do with carbon fiber shoes, and what he wishes he could tell his younger self.

**AN UNCONVENTIONAL BEGINNING**

When he started college, Khan planned to go into sports medicine (his father is a doctor), but later changed his major to economics. After graduation and his first experience in banking, he decided he wanted to do something different and moved back home.

He had always loved cars growing up, and began working in the high-end car industry, mostly in sales and marketing. He had the idea for traveling regional car demonstrations for Lamborghinis and other high-end cars.

He became fascinated with the manufacturing side of the business, particularly the advanced materials, which led to a job in the Tri-Cities. That’s where he began the work in 2010 that turned into Carbitex.

“When I realized how relatively new carbon fiber was in the greater scheme of materials, honestly, I just started tinkering in the garage,” Khan said.

**BORN IN THE GARAGE**

The garage contained a small oven, a small press (think of the kind used to put decals onto T-shirts), some hand tools, things to mix materials, and small tables to cure and process.

“The premise essentially was, carbon fiber is this advanced material, it’s still new. I think we can harness its properties in a different way. Let me just try to prove that.”

At one point in the prototyping process, they were running a homemade oven overnight.

“There are few things more concerning than running an industrial oven that you’ve made yourself without any engineering background overnight in a facility that you’re renting,” Khan said with a laugh.

**ABOUT CARBITEX**

Carbitex focuses on flexible carbon fiber technology. Typically carbon fiber is very rigid (think airplane fuselage or hockey stick). Carbitex harnesses the same high-performance properties but in flexible form. Carbitex has four patents with another six pending.

Originally eyeing vast potential markets in consumer electronics, fashion, aerospace, oil and gas, and more, the company has since focused on providing material for other industries to use in their own products. For now, they’re zeroed in on the footwear industry, but will add other markets in the future.

The company’s three main product lines are CX6, a highly flexible replacement for leather; AFX, which is asymmetrically flexible (stiff in one direction, flexible in the other); and DFX, which is dynamically flexible, changing stiffness as needed.

With their unique flexibility properties, AFX and DFX go into the mid-sole of a shoe. That offers the protection of a hiking boot, but lighter and thinner and more supportive — and with the ability to flex like a sneaker when the foot is bent.

Carbitex has 18 employees and is in the process of scaling up “a couple orders of magnitude” from its current output.
He remembers sleeping on the concrete floor with a roll of paper towels for a pillow in front of the oven door.

“I was the fire alarm,” he said. “If something caught on fire it would wake me up. Those are the things you end up doing to get things going.”

HELP FROM PNNL
At a key point in the development process Khan turned to Pacific Northwest National Laboratory, which offers 40 free hours of engineering support, R&D and testing for startups through its Technical Assistance Program (TAP).

PNNL had equipment that Khan needed for final tests that he’d need to secure customers and further funding.

“They ran our materials on the lab equipment they had,” Khan said. “It was the proof of concept we were looking for.”

Another key to his success was finding the right investors, people who understood the unique needs and timeframes of manufacturing.

“We had a lot of trust from our investors and none of this would have been possible without their support,” Khan said.

A NEW IDEA
Carbitex’s products are opening new ways that this light, strong material can be used.

Their product DFX, which can change its flexibility depending on its use, goes into the mid-sole of a shoe. When someone is walking on a basketball court or soccer field it is very flexible, but as you go to run it acts like a track spike. That allows the athlete to make the best use of their energy.

Typically the stiffness of the mid-sole of a shoe will be based on an average compromise of the use case, but Carbitex’s dynamically flexible material changes the equation.

“It eliminates a compromise, and if you can eliminate a compromise, you can be cost-justified and integrated into the existing manufacturing methods,” Khan said. “It should be the new standard.”

FIND YOUR FOCUS
Rather than start a company with an elaborate and highly structured business plan, Khan suggests young entrepreneurs use a more iterative process. Have a strategy, evaluate it, test the assumptions on which it is based, then regularly repeat — and continue to make forward progress.

In his case, he had originally planned to make consumer products with his material, but as he moved forward, he realized that his niche would be to commercialize the material rather than a specific product.

After developing a uniquely flexible form of carbon fiber, Khan and Carbitex saw a world of applications for their product, from electronics and fashion to aerospace.

A few years ago, they decided to focus on footwear, at least for now. They see future opportunities in construction, prosthetics, biomechanical components, aerospace and more.

MADE IN THE USA
Khan was CEO of Carbitex for six years but stepped down from that leadership role two years ago. He remains chairman. Since last fall, he has been based in Hong Kong to be closer to his company’s customers in the footwear industry.

Since Carbitex has Monday morning meetings in the Tri-Cities, Khan will ride the time difference and stay up until 1 a.m. to take part.

With unique intellectual property and a manufacturing process that is not workforce-heavy, Khan and Carbitex are keeping their advanced material production squarely in the United States — in the Tri-Cities, to be precise. It’s all under one roof — office, manufacturing facility, and labs for development and testing.

“We’re the only ones in the world that are doing what we’re doing, so it makes sense for us to control that process and keep the manufacturing in house,” he said.

Their biggest challenge is logistics as they work with customers in Asia that expect short lead times from nearby suppliers who are often just an hour or so away.
“Maintain your convictions. So many people are just going to tell you all the reasons something can’t work, but for every reason something can’t work, there are a number of reasons why it can.”

— Junus Khan, Founder and chairman, Carbitex

“It’s a month over the ocean, and air shipment can be more expensive,” Khan said. “Luckily, our material is fairly light.”

ADVICE FOR OTHERS

A young entrepreneur may have an idea for something cool, but for a company to succeed, Khan said the product needs to either solve a problem for customers — or be something they didn’t know they needed, but once they experience it they can’t imagine life without it.

“I think I had a very healthy or maybe unhealthy dose of being naive,” Khan said. “I could see step 10, where we wanted to go, and I could see step one, but I completely underestimated steps two through nine. But once you dive into it, if you have the grit to push through and do it in a timely way, you get to the other end.”

And while it’s important to listen to outside ideas and feedback, entrepreneurs need to evaluate that input critically and make their own decision.

“If I’d listened to some people in the industry say ‘What are you doing? That’s not what people want,’ Carbitex might not exist right now,” Khan said. “Maintain your convictions. So many people are just going to tell you all the reasons something can’t work, but for every reason something can’t work, there are a number of reasons why it can.”

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