

New material may help create hypersonic aircraft

WASHINGTON: Scientists have identified an extremely lightweight material that can withstand a high temperature and stress, a step towards developing hypersonic aircraft able to travel at five to 10 times the speed of sound.

The study by researchers at NASA and Binghamton University in the US, could lead to a drastic decrease in flight times.

There are currently quite a few obstacles when it comes to building these super planes, said Binghamton University Associate Professor Changhong Ke.

The first of which is finding a material that can hold up to hypersonic travel.

"Our study used what are called boron nitride nanotubes (BNNTs). NASA currently owns one of the few facilities in the world able to produce quality BNNTs," said Ke.

Typically, carbon nanotubes have been used in planes for their strength - they are stronger than steel - and their ability to conduct heat, researchers said.

However, BNNTs are the wave of the future when it comes to air travel, they said.

"While carbon nanotubes can stay stable at temperatures up to 400 degrees Celsius, our study found that BNNTs can withstand up to 900 degrees Celsius," said Ke.

"BNNTs are also able to handle high amounts of stress and are extremely lightweight," Ke said.

Withstanding high temperatures is an important requirement for any material meant to build the world's next super planes, according to the study published in the journal Scientific Reports.

However, Ke noted that the material has to be able to maintain both structural and mechanical properties in an oxygen environment.

Researchers said that while the study has brought new light to the strength and stability of BNNTs, their use on planes may not be a reality for another five to 10 years.

"Right now, BNNTs cost about USD 1,000 per gramme. It would be impractical to use a product that expensive," said Ke.

However, researchers noted that carbon nanotubes were about the same price 20 years ago.

As more studies indicated the usefulness of carbon nanotubes, the production rates increased and prices went down to the current rate, between USD 10 and USD 20 per gramme.

Ke sees the same fate coming down the line for BNNTs.