

CERAMIC MATRIX COMPOSITES

Ceramic matrix composites (CMCs) are made of ceramic fibers embedded in a ceramic matrix. The fibers prevent cracks from spreading through the material while the matrix stabilizes the fibers and adds strength.

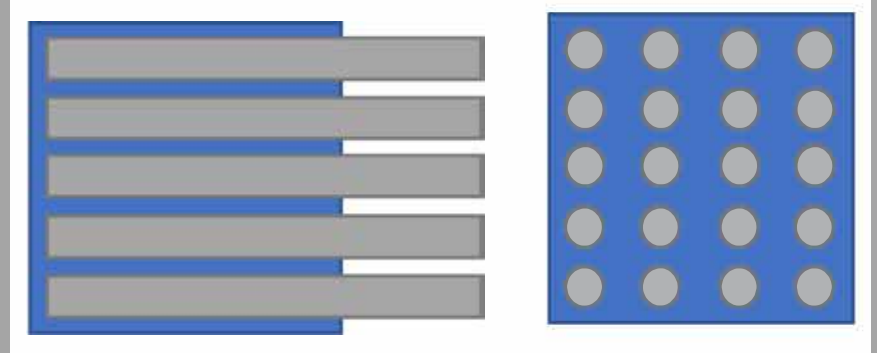


Diagram of the side and front views of a CMC showing fibers (gray) and matrix (blue)

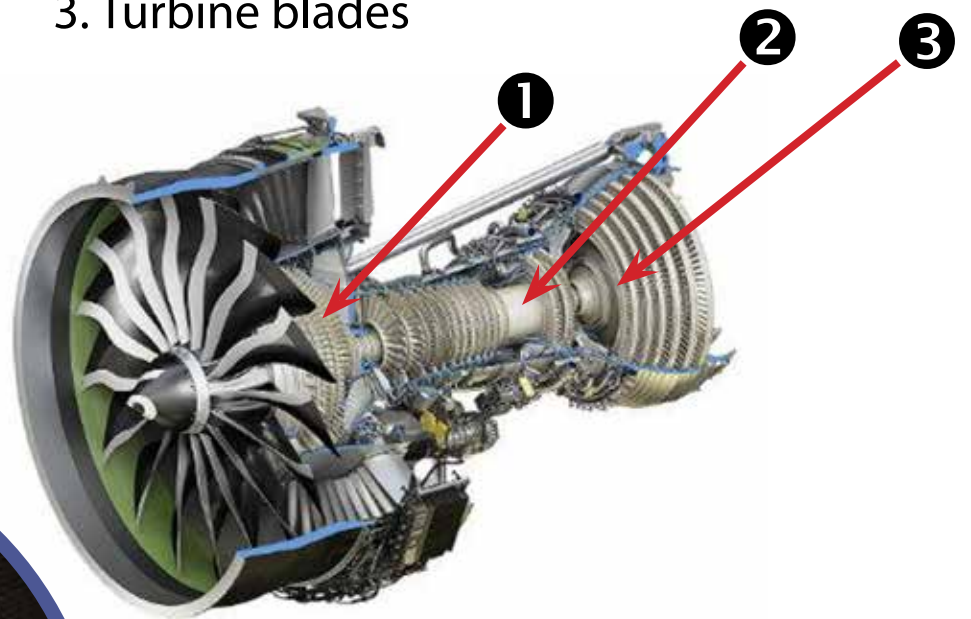


Fracture surface of a CVI-SiC/SiC-material (fibre reinforced ceramics with SiC-fibres and SiC-matrix, manufactured via a CVI-process (Chemical Vapour Infiltration). SEM-picture of MT-Aerospace AG, Augsburg, Germany.

CMCs are used in some aircraft engines such as the new GE9X.

Components made of CMCs are

1. Stator vanes,
2. Combustion chamber
3. Turbine blades



CMCs are also used in brake disks for luxury cars and motorcycles. One common material used is carbon fibers in a carbon matrix.



CMCs were used in heat shields for the space shuttles because they are lighter and can withstand more temperatures than other materials. One type of CMC used in the space shuttles were carbon fibers in a SiC matrix.



Want to learn more?

Check out The American Ceramic Society's

information page at

<https://ceramics.org/about/what-are-engineered-ceramics-and-glass>

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