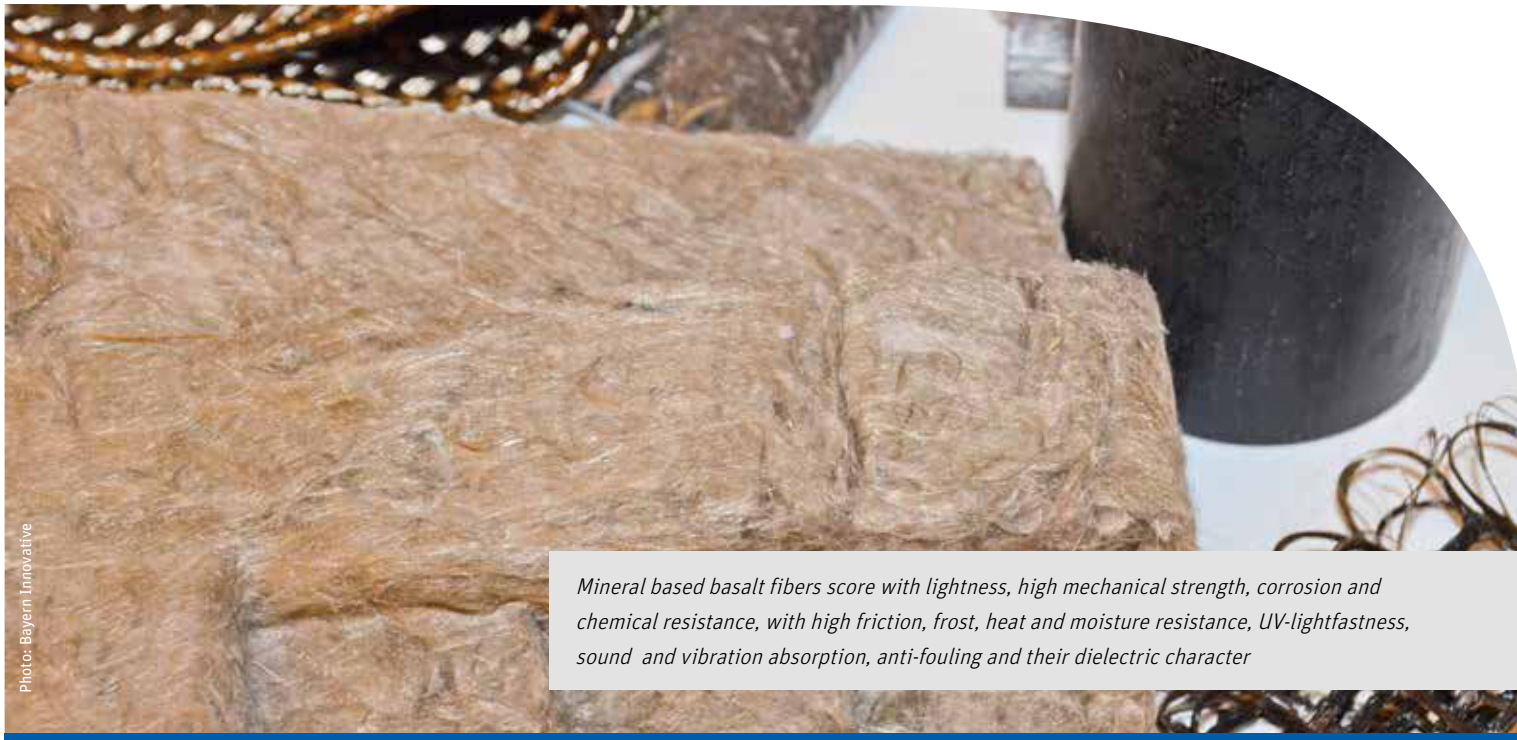

Photo: Bayern Innovative

Mineral based basalt fibers score with lightness, high mechanical strength, corrosion and chemical resistance, with high friction, frost, heat and moisture resistance, UV-lightfastness, sound and vibration absorption, anti-fouling and their dielectric character

V FOR VERSATILE AND VIABLE

Basalt fibers – ready to enter high performance industries?

Increasing development efforts and publicity on the volcanic basalt fiber arouse interest of Airbus Helicopters regarding application potential in aeronautics. Subsequently a screening was carried out – here come the findings.

Suppliers state that the properties of the filament may expand the profile of currently used reinforcements in composites.

Statements, ...

With mechanical properties similar to S-2 glass, the price range lies between E and S-2 glass fibers. Furthermore, the excellent thermal and chemical durability as well as abrasion resistance are highlighted. Environmental aspects are addressed by the use of an abundant natural raw material, low energy consumption during manufacturing and possibilities for recycling. The profile is completed by high thermal/electrical insulation and acoustic damping properties.

... challenges ...

Besides beneficial economical and material properties, an additional requirement for aeronautical materials is reproducible high quality with low scatter within and between material batches. Airbus Helicopters is currently investigating these aspects in the frame of a screening of off-the-shelf basalt fibers.

In fact, basalt fiber is produced in a melt spinning process which is similar to glass fiber production. Yet some additional challenges emerge. The use of a natural raw material with high thermal insulation may cause thermal and chemical inhomogeneity during the melt spinning process. Another focus is on the interaction between basalt fiber, applied sizing and common aerospace resins.

... and disparities

A wide spectrum of qualities was found during the screening including individual strengths and weaknesses of each supplier. Nevertheless, some products can compete with the reference S-2 glass fibers. It is therefore a logical move that the industry is on a quest for applications where the individual characteristics of their product match perfectly. For this task, valuable support comes from the BasaltFaserNetzwerk (www.bafanet.com). A prominent use case is to replace steel rebars in the building industry by a more lightweight and corrosion-free basalt reinforcement.

In order to accelerate the improvement progress, high performance applications shall be targeted as soon as possible. Mechanically uncritical structures such as interior parts and linings in the aeronautical and automotive industry can be appropriate. The lessons learnt, an increased and continuous production will enable the manufacturers to work on the remaining quality aspects and to offer a high performance product.

Further information:
Felix Bauer,
Doctoral Candidate Organic Materials, Laboratories, Materials and Processes, ETLO, Airbus Helicopters, Donauwörth,
phone +49 (0) 906 / 71 24 58,
Felix.Bauer@airbus.com,
www.airbushelicopters.com