



Research and development

# Fibres are changing dentistry

By Professor Pekka K. Vallittu DDS, PhD, Finland

The replacement of damaged dental tissues and utilising modern adhesive techniques have brought restorative and prosthetic dentistry into a new era. This new era is characterised by minimally invasive and non-metallic dentistry. Although adhesive techniques have developed considerably, especially with dentine bonding systems, only minor advances in composite resins have occurred. The development of particulate filler systems have improved wear resistance and lowered abrasiveness of the composite, but there have only been minor improvements in the mechanical properties and polymerisation contraction.

The field of science that focuses on mimicking natural structures is known

as biomimetics. Nature creates the material components and combines them as composites. In many of the natural materials which require high strength and toughness, the main constituent of the material is a high aspect ratio fibre. Examples of composites found in nature include wood, bone, ligaments, dentine and enamel. Fibres, if they have higher strength than the binding matrix and proper adhesion to the matrix, can efficiently reinforce and toughen a material. For this reason, fibre-reinforced composites (FRCs) have been utilised in variety of technical and everyday applications since the 1950s.

Interestingly, the use of FRCs in dental and medical fields has been



CONTINUE READING ON...

LESEN SIE WEITER...

CONTINÚE LEYENDO EN...

CONTINUER LA LECTURE SUR ...

CONTINUA A LEGGERE...

**'GC'**

GET CONNECTED

**SMILE**  
PROGRAM

