

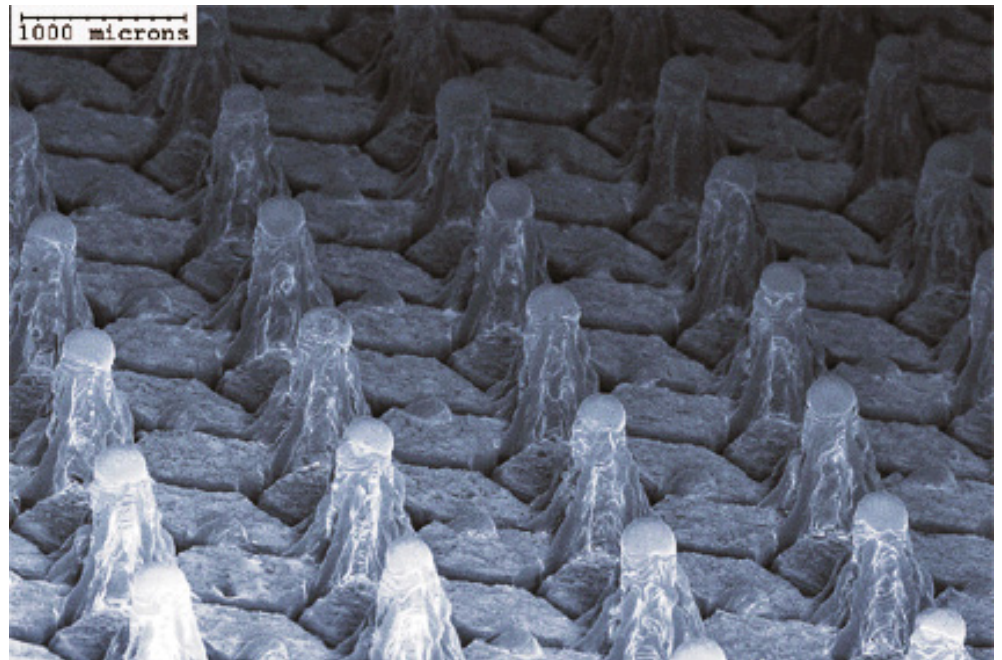
Materials processing technology



Surface modification using an electron beam



Industrial applications



## What is Surfi-Sculpt?

Surfi-Sculpt™ is a materials processing technology that manipulates an electron beam to modify surface textures so that they are more useful and efficient in industrial applications – such as for enhanced bonding of composites to metal.

With the ability to create a variety of hole and slot patterns Surfi-Sculpt is applicable to a wide range of projects and materials.

Computer software controls the location of the beam precisely and repeatably, making it a suitable process for manufacturing high-volume and value components, with the capacity to form several hundred features in less than ten seconds.

The process is highly flexible, offering the opportunity to design customised features in most industries, including medical, adhesive, and hydrodynamic applications.

Surfi-Sculpt works by melting substrate material using the heating action of the beam and then displacing material using the combined effects of temperature-variant surface tension and vapour pressure at the point of action of the beam. This process is repeated or overlapped to give the desired features.

A gallery of applications can be found on the reverse. Surfi-Sculpt is a trade mark of TWI Ltd.

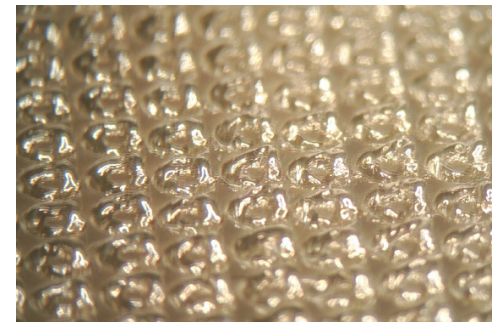


Figure 1. Ultra-coarse surface.

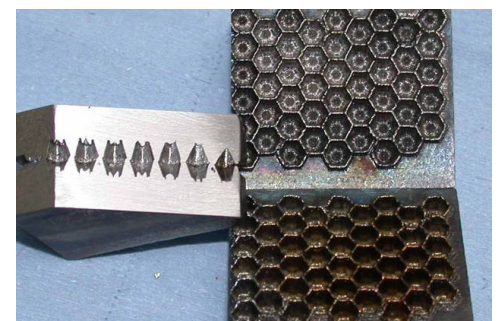


Figure 2. Honeycomb surface.



Figure 3. Ultra-light surface.

# Applications

## Biomedical Industry: Orthopaedic Implants

Surfi-Sculpt can increase bio-functionality for implants and devices – such as orthopaedic bone implants – by direct processing or by treatment of moulds.

This allows for design improvements, including implant fixation, product consistency, and successful integration.



Figure 4. Orthopaedic implants.

## Manufacturing: Rotational Symmetry

Many parts of common products, such as handles or axles, have rotational symmetry.

Internal or external screw threads can be added using Surfi-Sculpt, as well as criss-cross patterns for an enhanced grip.



Figure 5. Rotational symmetry.

## Materials Science: Surface Coatings

Surfi-Sculpt can manipulate surfaces to promote adhesion between a substrate and a coating (right). This could be taken advantage of in several industries including aerospace, medical, and automotive.

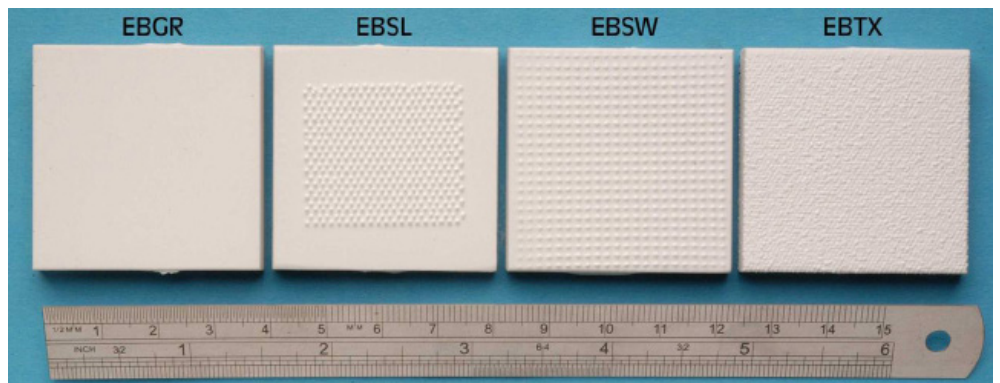


Figure 6. Surface coatings.

### USA

Cambridge Vacuum Engineering Inc.  
Unit 7 630, Silver Street  
Agawam  
Massachusetts  
01001-0867  
United States of America

+1 (413) 789 4600



### UK Headquarters

Cambridge Vacuum Engineering  
Pembroke Avenue  
Waterbeach  
Cambridge  
CB25 9QX  
United Kingdom

+44 (0) 1223 863481

E-mail: [sales@camvaceng.com](mailto:sales@camvaceng.com)  
Web: [www.camvaceng.com](http://www.camvaceng.com)

### China

Aquasium Technology (Beijing) Co. Ltd  
Suite 5, East Tower, 10<sup>th</sup> Floor  
B12 Jianguomenwai Avenue  
Beijing  
100022  
People's Republic of China

+86 (10) 512 25102

© Aquasium Technology Limited trading  
as Cambridge Vacuum Engineering