COLUMNS

Graphene set to change mobility and much more

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By Dan Hodges

One of the highlights of Mobile World Congress 2016 was the Graphene Pavilion. Graphene is one of the most versatile substances available to mankind. The first 2D atomic crystal a single layer of carbon atoms it is the thinnest object ever obtained: a million times thinner than a human hair.

Graphene is also the world's strongest material, stronger than a diamond, 200 times stronger than steel, and yet lightweight and flexible.

When was it discovered?
Graphene is a recent discovery.

Groundbreaking experiments on graphene resulted in European physicists Professor Sir Andre Geim and Professor Sir Konstantin Novoselov winning the 2010 Nobel Prize in Physics.

Graphene is impermeable to molecules, and is extremely electrically and thermally conductive. It enables electrons to flow much faster than silicon. It is also a transparent conductor, combining electrical and optical functionalities in an exceptional way.

How will Graphene change mobility?
Companies need to be aware of the coming world of flexible smart screen technology.

One particular area in which we will soon begin to see graphene used on a commercial scale is on liquid crystal displays (LCD).

Graphene LCD touchscreens for smartphones, tablets and desktop computers and televisions are in the early stages of development.

In terms of potential real-world electronic applications, we can eventually expect to see such devices as grapheme-based e-paper with the ability to display interactive and updatable information and flexible electronic devices including portable computers and televisions.

Imagine getting the Macy's graphene catalog where the images and sale prices are updated in real-time.

We have seen the effect of different media form factors from big radios to portable transistor radios to the Sony

Walkman to the iPhone.

The time to embrace the future is now, and wise brands and marketers should seek to further their knowledge on graphene and engage in trials in preparation for commercial deployment.

Graphene will have wide and significant effect
Graphene could have a significant effect on industries and sectors such as electronics, medicine, aerospace, automotive, energy storage, water desalination, coatings and paints, solar technologies, oil and communications.

Potential applications for graphene include new medical and living tissue technologies, including rapid DNA sequencing, targeted drug delivery, tissue regeneration and bionic implants such as artificial retinas.

Other applications include light, ultra-efficient super capacitors that are a thousand times faster than standard batteries and light, flexible, shatterproof touchscreens for mobile phones, tablets and wearable technology.

A number of graphene-based and graphene-enhanced products are already on the market, including graphene-based touchscreens, lightweight tennis rackets and an anti-theft packaging system.

Other devices including a flexible electrophoretic display for e-book readers have already reached prototype stage, and further prototypes of graphene-based display devices, such as flexible touchscreens, rollable e-paper and foldable OLEDs (optical light-emitting diodes) based on medium-quality graphene are likely to be rolled out over the next five years.

THE EFFECT of graphene is expected to be extensive.

There are applications and products yet to be invented that will fuel "The Graphene Economy."

The most effective way forward for companies is awareness and iterative innovation.

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