

Graphene tubes are the future of manufacturing

What’s the next step for technology? OCSiAl says single wall carbon nanotubes will change manufacturing to the same extent as the industrial revolution.

(Palo Alto – 23 May 2014) Speaking at The Institute of Electrical and Electronics Engineers’ (IEEE) SF Bay Area Nanotechnology Council monthly event in Santa Clara, California, OCSiAl chief technology officer Mikhail Predtechenskiy and vice president Gregory Gurevich demonstrated how carbon nanotubes can and have been successfully added into products using existing, standard manufacturing processes and facilities without the need for further investment or development.

Nanotubes are one atom thick sheets of graphene that are [rolled into tubes](#), and is one of the strongest, lightest and most conductive materials known to mankind. OCSiAl [recently announced a breakthrough in producing carbon nanotubes](#) in bigger, better quality batches that was not possible before. The technology has succeeded in dropping prices to commercially viable levels for the first time, offering nanotubes for sale from \$2,000 per k/g where the previous price was around \$100,000 per k/g.

The following chart shows both real world and projected examples of current applications for carbon nanotubes, and demonstrates the level of commercial viability achieved:

Product	Guide amount of nanotubes	Cost	Application date	Effect
Cell phone batteries (Lithium-Ion)	100mg	\$0.20 per unit	Present	Graphene nanotubes increase cycle life, adding approximate one year, allow to use more powerful hardware, and increase the safety of the lithium ion battery.
Tyres	2 grams	\$4 per unit	Present	Enhances fuel efficiency, durability and traction control at the same time
Flexible touchscreens	Conductive layer less than 100 nm thick	\$10 per m ²	Present	90% transparency, 110 ohm/sq surface resistance achieved at 90% transparency making for a high contrast flexible screen
Composite panels	0.05%	\$2 per kg	Present	Tensile modulus and flexural strength of a carbon fibre reinforced polymer (CFRP) plate, widely used in sporting and automotive fields, is increased 35%.

Source: OCSiAl

All OCSiAl results have been achieved as a part of industrial trials with partners, producing mass products. As it was announced during the presentation, CNT application market will be around 70 billions USD and will exceed 145 000 tons by 2025. Carbon nanotubes will also



increase the range of applications available in the future. Previous 'blue sky' technologies such as the possibility of building NASA and Google-X's 'space elevator,' or the San-Francisco Hyperloop proposed by Elon Musk.

The world's first nanotechnology company, [Zyvex Technologies](#), has already begun integrating OCSiAl nanomaterials into their products. *"The use of SWCNTs could open the door to fundamental change in many industries, but there has always been an invincible obstacle: SWCNTs were only available in small quantities at sky-high prices, and quality wasn't guaranteed. OCSiAl helps make nanotechnology applicable for many companies desperate for a commercially viable materials innovation,"* said Lance Criscuolo, President of Zyvex Technologies.

About OCSiAl – www.ocsial.com

OCSiAl is an international technology firm with operations in Russia, USA, UK, Germany, South Korea and headquartered in Luxembourg. Along with TUBALL[®], the raw 'as produced' SWCNT material, OCSiAl also offers specially purified (up to 99% of SWCNT) and modified nanotubes and master batches. Having already stockpiled a large reserve of carbon nanotubes, OCSiAl has agreed terms with a number of international partners for joint product development and has signed, or is about to sign, such agreements with some well-established design and technology firms. OCSiAl welcomes new partners to get in touch via [website](#).

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Enquiries:

Ksenia Kulgaeva, Head of Communications

+1 415 906 5271 (US)

+44 203 126 4860 (UK)