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Israeli Company Developing 'NanoArmor' Tech for Future Warfighters

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As we've said before, the Israelis are proving to be an innovative bunch these days. Awhile back, an Israeli company called ApNano Materials, Inc. came out with a "the first commercial nano-based lubricant" called Nanolub. According to the Israeli foreign affairs and defense news site IsraCast, Nanolub is a solid lubricant (or, solid nano lubricant) that exhibits superior friction reduction (and thus wear and temperature reduction) compared to other solid lubricants, especially at high loads. It also reportedly reduces galling, seizing, and fretting of metal surfaces.

Based on nano-sphere (of inorganic compounds) technology co-discovered at the Weizmann Institute of Science, Israel by Dr. Menachem Genut (menachem@apnano.com), President/CEO and Co-Founder of ApNano Materials, Inc., Nanolub remains effective even on non-polished surfaces. Composed of nested spheres, Nanolub lubracates by rolling over the surface like miniature ball bearings. The other scientists involved with the discovery of this nano-material are Professor Reshef Tenne (reshef.tenne@weizmann.ac.il), ApNano Chief Scientific Advisor and recent winner of the Materials Research Society medal, Professor Gary Hodes (gary.hodes@weizmann.ac.il), and Dr. Lev Margulis. All men worked in the Weizmann Institute's Nano-materials Synthesis Group in the early 1990's, when the discovery of this new class of fullerene-like inorganic nanostructure material (IF material) was made. Fullerenes (or fullerene nanostructures) represent a new form of carbon nanostructure.

Now, a year later, instead of sitting around patting themselves on the back, ApNano is developing a new "shielding and protection" technology that IsraCast has referred to as...

"NanoArmor" or "Nano-Armor". The new nano-material a.k.a. nanotech material is supposed to be ultra-strong and ultra-shock absorbant. It's reportedly capable of withstanding shock pressures created by impacts of up to 250 tons per square centimeter. In a test that was performed by Professor Yan Qiu Zhu (kafi2@sussex.ac.uk) of the School of Mechanical Materials and Manufacturing Engineering at the University of Nottingham, England, a sample of the ApNano nano-armor material was subjected to an impact by a steel projectile traveling at "up to" 1.5 km/second. IsraCast reports that the ApNano NanoArmor material samples "remained essentially identical compared to the original material" after impact from the steel projectile. In a separate study, IsraCast reports that Professor J.M. Martin of Ecole Centrale de Lyon (France) tested the nanomaterial and found it to be stable at up to at least 350 tons per square centimeter (350 tons/cm2) under isostatic pressure.

ApNano is reported to be in the process of increasing their production capability to 100-200 kilograms of the

nanotech armor (i.e. nanotechnology armor) material per day, and will be at full-scale production levels by 2007. According to Dr. Genut, by the time ApNano reaches it's full production goals, the new NanoArmor nanotech armor material will cost significantly less than a similar amount of carbon-based fullerenes. However, further testing is necessary, and ApNano is looking for additional funding for the nano-armor project.

The use of nanotechnology in future ballistic armor solutions appears to be inevitable. It would seem that it's simply a matter of time (and a short time, at that) before nanotech ballistic armor armor (including nanotech body armor) is commercially available. Should be interesting.

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Click here to read the original IsraCast article on "nano-armor", titled *Nano-Armor: Protecting the Soldiers of Tomorrow*.

Click here to read IsraCast's article on Nanolub solid nano-lubricant, titled *Solid Nano Lubricant Developed by Israeli Company*.

Click on this link to read about Prof. Reshef Tenne being named a 2005 MRS medalist.