Coatings hide implants from the body
Carmen Scholz of the University of Alabama, Huntsville, has been working on the customized synthesis of biocompatible polymers that can coat sensors that are then implanted into the body to cloak them from the immune system, referred to as a stealth character. Recent research proves the in-vitro stability and nontoxicity of thin layers of customized block copolymers that coat tiny sensors, which were produced by a collaborator group at the University of Technology in Dresden, Germany. After further testing, coated sensors could be implanted in patients to sense blood glucose, carbon dioxide, and serum pH levels. The coating uses a multilayer concept that includes a hermetic sealing layer, a chemically inert innermost diffusion barrier for ions and humidity, and a surface layer of amphiphilic block copolymers.

Implanted into a patient beneath the skin, coated sensor data could be monitored wirelessly to control an insulin pump or monitor bodily functions to provide greater information to physicians treating patients with respiratory problems. Because the coatings make the implants invisible to the immune system, the body does not react to them as invaders and allows them to function. For more information: Carmen Scholz, 256/824-6188, scholzc@uah.edu, www.uah.edu.

Enhanced droplet condensation improves heat transfer
Researchers at Massachusetts Institute of Technology, Cambridge, developed an approach to improving heat transfer in power plants and cooling systems that they say could provide a 100% boost in efficiency of heat transfer over conventional systems. The new system modifies the traditional condensers used to turn steam back into water: A copper pipe coated with a combination of oil and a hydrophobic material with local hydrophilic sites exhibits a dense concentration of droplet formation, and quick release of those droplets before they have a chance to grow large. This leads to greatly enhanced heat transfer and could improve the overall efficiency of power plants.

The innovation combines two properties: A nanopatterned surface, etched with tiny pillars, reduces contact between droplets and the surface; and a layer of oil coats the surface, helping droplets to form abundantly on the surface and also making it easy for them to slide off. Because droplets condense right through the thin coating of oil, and end up being immersed in oil, researchers coined the term “immersion condensation” to describe their new system. For more information: Evelyn Wang, 617/324-3311, enwang@mit.edu, http://drl.mit.edu.

Steel shot blasting machine cleans pipes
The FasterBlaster from RBW Enterprises Inc., Newnan, Ga., is said to be the only machine on the market that can blast clean both vertical and horizontal surfaces and pipes. It is now available in models that can cover either 16- or 32-in. blast patterns, reportedly saving time, labor, cleanup, wastes, and costs. Both units are available with a choice of 30 or 60 hp electric motors. Because the machine is a fully contained system, no environmental protection measures are needed at job sites. The system features a flat mat seal that creates a suction cup effect against the wall, roof, or floor surface. The seal vacuums tightly over weld seals. In addition, there are zero emissions, making it possible for paint to be applied simultaneously near the operating machine. www.rbwe.com.

The new FasterBlaster: Shot blasting is now available in models that can cover 16- or 32-in. blast patterns. Courtesy of PRNewsFoto/RBW Enterprises.

Titan Spine, Mequon, Wis., was awarded four new patents in 2013 relating to the company’s implant surface technology, as well as the design of the Endoskeleton interbody device and specialized system instrumentation. A proprietary treatment is applied to titanium devices producing a textured surface that creates optimal surface energy for enhanced bone production at fusion sites. Additional aspects of the Endoskeleton platform protected by these new patents include the devices’ unique shape, designed to rest on the apophyseal ring of the vertebral endplate for strength and stability, and large windows for increased bone graft volumes and improved radiographic visualization and fusion evaluation. www.titan spine.com.

NASA Langley Research Center, Hampton, Va., joined the Commonwealth Center for Advanced Manufacturing (CCAM), Richmond, Va., as a government member. The move creates opportunities for joint participation in research and development of new surface engineering technologies and manufacturing systems. NASA’s expertise, combined with the manufacturing capabilities of CCAM members, will speed the process of bringing novel technologies to market sooner. www.ccam-va.com, www.nasa.gov/centers/langley.

Chemetall, New Providence, N.J., announced the approval of Oxsilan 9810/2 for Federal Specification TT-C-490, Type IV on abrasive blasted steel. According to company sources, this means that for the first time, there is a viable replacement for zinc phosphate in military applications. Oxsilan 9810/2 is phosphorous-free and does not contain any regulated heavy metals. The technology is available in a ready-to-use formula. www.chemetallus.com.