

Partnering to discover electrifying advances

In July, General Cable Corporation and Manhattan Scientifics, Inc., entered a joint development agreement. Below, Dr. Srinu Siripurapu, vice president of R&D at General Cable, explains why the company sought outside expertise to design and develop nano-structured aluminum for wire and cable applications, with a strong focus on overhead conductors for the transmission of power.



Dr. Srinu Siripurapu

WJI: Why did General Cable want a partner?

Siripurapu: We believe in an Open Innovation model. The concept is that in a world of widely distributed knowledge, companies cannot afford to rely entirely on their own research, but can benefit from sharing ideas, processes or inventions from other companies. Via this approach, we identify partners from anywhere in the world who have the best technology expertise in the innovation areas we target.

WJI: What need led you to seek a partner?

Siripurapu: Some 7% of energy is lost between a generation source and customer meter in the U.S., an annual loss of some \$25 billion. Transmission and distribution overhead conductor lines are the dominant source of these energy losses. Nano-structured aluminum has the potential to offer superior balance of strength and conductivity, which can be leveraged to significantly improve the efficiency of electrical power transmission and distribution. It can also improve safety and reliability of the transmission grid, as the nano-structured aluminum based conductors are expected to be resistant to high temperatures.

WJI: Why Manhattan Scientifics?

Siripurapu: We want to supply the best nano-structured aluminum solution. Manhattan Scientifics is a world leader in bulk nanostructuring of metals and alloys through severe plastic deformation (SPD) techniques. Most work in the literature has focused on mechanical alloys for structural applications, such as aerospace. We have a history of innovation in electrical grade alloys, and we believe our combined expertise will make this a great team effort. We believe the potential of nanostructured aluminum to offer a superior balance of strength and conductivity can be realized by Manhattan Scientifics's background in nanostructuring and our expertise in electrical power cables.

WJI: Does each company enter this with a shared sense of what to do, and does General Cable have enough experience with nanotechnology to be an equal partner?

Siripurapu: In entering any such relationship, we share a common set of goals with clear milestones with our partners. The Open Innovation model creates powerful relationships with the flexibility and speed required to find a

solution that will benefit our mutual customers. As for our ability to contribute, General Cable has established expertise in nanotechnology for compounds that provide superior performance in fire resistance, electrical conductivity, dielectric strength and mechanical properties for wire and cable products.

WJI: Is this akin to a marathon, where the entrants know that the finish line is a long way off?

Siripurapu: General Cable is committed to sustained innovations. We focus on a mix of incremental innovations with near-term impact and industry-changing innovations over the long run. Our partners understand that breakthrough innovations can require multi-year efforts and that we must share a vision if we are to jointly develop a "game changer." We focus on multiple innovation areas that will benefit our utility customers on many fronts, from safe handling and ease of installation to increased capacity and reliability of our products.

WJI: Would your findings be patented?

Siripurapu: Intellectual property is important to maintain differentiation for our products. We have a focused patents strategy that covers our innovation areas. Our partners are included in the patents strategy and we maintain transparency

through the joint development process, which builds trust and strengthens the partnership.

WJI: Is there anything else you would like to point out?

Siripurapu: General Cable continues to build on its 170-year history of innovation through two approaches. The first is customer-driven development of new products and services, often by collaborative programs with other industry leaders. Secondly, we often recognize an industry need and develop a solution that anticipates customer demand. One recent example that has shown extraordinary results is TransPowr® with E3X™ Technology, the utility industry's first heat-dissipating overhead conductor, which meets the need to change two of the key material properties that affect the thermal rating of bare overhead conductors.

Editor's note: see related story on p. 18.

