
Safe Use of Easton N-FUSED™ Arrow Technology Containing Carbon Nanotubes¹

In 2008, Easton introduced the N-FUSED™ Carbon ST AXIS[®] arrow, the first arrow ever produced with fully functionalized carbon nanotubes (CNTs). Easton partnered with world leading nanotechnology experts Amroy Europe and Bayer MaterialScience to utilize Hybtonite[®] resin with Baytubes[®] CNTs to provide the AXIS[®] shaft with improvements in strength, toughness, and vibration control. The response to the new N-FUSED™ AXIS[®] has been tremendous, as dealers and archers experience the new level of performance firsthand.

Some questions have recently been raised about the safety of carbon nanotubes. In May 2008, a study by Poland et. al. was published online in the magazine “Nature Nanotechnology.” They reported that some relatively rigid and long CNTs can cause effects in mice that are similar to the effects known from asbestos or other long, rigid, inhalable fibers. In contrast, the same study showed that other CNTs with a different morphology (“short and tangled”, which are similar to those utilized in the N-FUSED™ AXIS[®] arrow) displayed no pathogenic fiber effects.

This study has led to questions from our valued customers and within the larger archery community regarding the safety of CNTs in the N-FUSED™ ST AXIS[®] arrow. This issue was addressed with our partners during the development of the N-FUSED™ processes. The safe use of CNTs has been the focus of much research within the nanotechnology community in the last years, and the research is ongoing.

ST AXIS[®] arrows with N-FUSED™ Hybtonite[®] resin and Baytubes[®] CNTs are safe for their intended use. Baytubes[®] CNTs used in AXIS[®] arrows are short, spiral-shaped, entangled and flexible, forming a kind of microscopic cotton ball. As such, they appear to have similarities with the short/tangled samples in the Poland et al. study, which did not show any pathogenic fiber effects. Additionally, the Baytubes[®] CNTs are tightly bound to the resin matrix. Indeed, Amroy’s patented process transforms the raw Baytubes[®] into a fully functionalized, covalently bonded mixture with epoxy resin, called Hybtonite[®]. Easton’s proprietary N-FUSED™ manufacturing process takes the Hybtonite[®] resin and transforms it into a cross-linked carbon-epoxy composite structure. According to Bayer MaterialScience, once CNTs are firmly embedded in a polymer structure, there is no realistic potential for inhalative exposure.

Easton is committed to safety and has long provided safety warnings and use instructions regarding the preparation, inspection and use of carbon arrows. These warnings can be found in our catalogs and on our website at www.bsafe.ws. These warnings and use instructions should be followed for the safe use of any arrow.

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¹ This contains information from Bayer MaterialScience’s *Statement re Poland et al. study on potential asbestos-like effects of CNTs* dated 2008-05-20.