

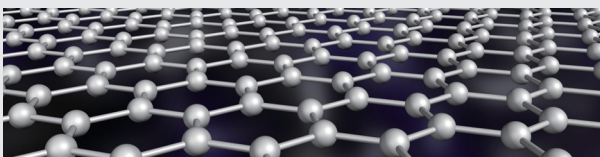
# **ARMOR GUYS** + GRAPHENE

With more than 30 years' experience in the hand and arm protection manufacturing business, safety has been at the very core of who we are and what we do. QS Group, and its subsidiary, Armor Guys, relentlessly pursue groundbreaking technologies that support both the environment and the user.

In 2009, QS Group began researching graphene for use in their hand protection and solar panel manufacturing businesses. In early 2017, after nearly a decade of R&D, QS Safety launched its first range of graphene-based gloves and sleeves: Kyorene®. Since then, we have sold millions of pairs of our Kyorene® gloves and sleeves to users around the world.

## **What Is Graphene?**

- Graphene is an allotrope of carbon which is a two-dimensional structure in a honeycomb lattice construction that is one-atom thick.
- When one million layers of graphene are stacked on top of each other they form graphite, a mineral consisting of carbon which is the most abundant material on earth.
- Graphene was known, but not isolated, until 2004 by two researchers from Manchester University who were awarded a Nobel Prize in 2010 for its discovery.



Graphene's honeycomb lattice construction

## **What Are Its Properties?**

- 1 million times thinner than a piece of paper
- 200 times stronger than steel
- Harder than diamond
- Flexible, transparent & conductive
- Inherently bacteriostatic, thermal regulating, odor neutralizing and UV resistant

## **How Do We Use Graphene In Our Gloves?**

- We take raw graphite and separate it down to the appropriate layers to which it becomes graphene.
- Next, we liquefy the graphene turning it in to Graphene Oxide (GO).
- From there, we covalently bond the Graphene Oxide (GO) to host yarns.
- As a result of the covalent bonding, the graphene cannot flake, shed, or come off the host yarn.

Graphene-infused yarn

