

## Q&A with Jeffrey Draa, CEO of Grolltex, Inc. providing Graphene Materials and Equipment for Electronics Manufacturers



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**CEOCFO: Mr. Draa, what is the concept behind Grolltex?**

**Mr. Draa:** Grolltex is a graphene materials and equipment company. We leverage unique discoveries and research in the area of graphene, which is a new advanced electronic material. We try to create unique value not only in the optimized production of the raw material graphene but also from specific products made of this futuristic material.

**CEOCFO: What do you understand about graphene that others might not have recognized yet?**

**Mr. Draa:** There are many different forms of graphene. The most sought after, the highest quality and most expensive is called large area, single layer graphene manufactured via a process called ‘chemical vapor deposition’ or CVD. Electronics manufacturers, to design and produce the most advanced products, are really looking for this CVD made graphene. To date, this material has been too expensive to produce for it to proliferate. We at Grolltex, have come up with a methodology to manufacture CVD graphene in a sustainable and inexpensive way. We hope to introduce this material to a much broader user base.

**CEOCFO: What is the difference in how you are able to accomplish what you do?**

**Mr. Draa:** To make graphene via CVD, it has to be grown on copper as a substrate. It can be thin copper like foil or it can be thicker like plates, but when you are done making graphene this way, today you have to destroy the copper to get to the graphene. Most people acid etch the copper. Some others use an electrolytic solution to get the graphene off of the copper. But both of those techniques render the copper unusable, essentially destroying it. So today, if you are going to make CVD graphene, you have to destroy a lot of copper. We have come up with a methodology to remove graphene from copper and not destroy any copper. In fact, we reuse that copper, putting it right back in to our manufacturing schema. We have actually engineered or optimized copper substrates for our process to be used again and again.

**CEOCFO: How much of a difference does that make in cost?**

**Mr. Draa:** It is on the order of 10x to 100x, depending on how much copper you are destroying today. Additionally, there are two other things we are optimizing about the current state of the art in CVD graphene production. First, acid etching copper creates a really toxic residue. Environmentally it is one of the worst effluents one can manufacture. We do not do that -we reuse all the copper and create no copper related effluent. The second thing is, regarding both acid etching copper or removing graphene with the electrolytic solution method, both of these processes take hours to perform versus our process that is done in minutes. Our process is much faster, we do not create the extra costs of destroying copper and we do not emit any copper related toxic residue.