# Carbon Gates Technologies LLC.

**"Producer of Laboratory and Industrial Grades Graphene"**

# Application

## Water-Oil Separation

The GNP of CGT has a very low defect density and low density of covalently bonded oxygen. Therefore, it is highly hydrophobic and highly oleophilic. This capability can be used to separate water from oil. In one experiment, a PVC tubing is filled with our GNP, and a mixture of oil and water (1:1) is fed on the top. At the bottom fresh water is extracted by means of gravity and oil is extracted in the GNP column.


*Figure: A column of our GNP separates oil from water*

In another experiment, CGT's graphene with the average in-lane dimension of 7 µm and the thickness of < 30 nm was demonstrated to absorb many organic solvents with various physical properties such as crude oil, used motor oil, DMF, ethanol, n-heptane, acetone, soybean oil, and n-hexane. So far, the best good oil absorption ability was in the range of 29–54 times its own mass.

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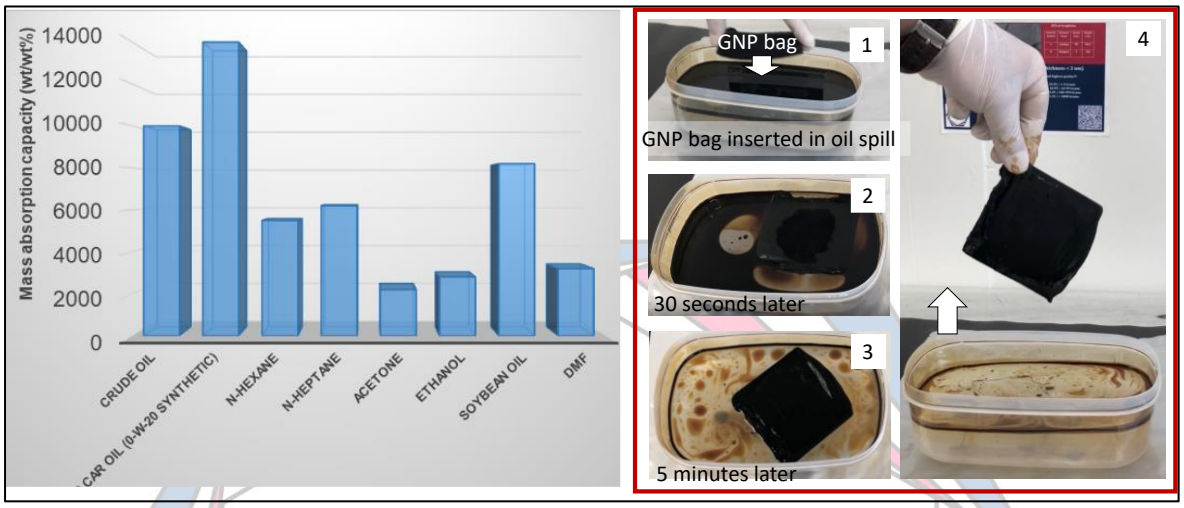


*Figure: The CGT of carbon gates can absorb oil more than 50-100 times its mass.*

*For a cool video of the oil absorption please follow this link:*
*https://www.youtube.com/watch?v=J2QjvHUaXK0&t=314s*

## Super hydrophobic and strong concrete

The graphene of CGT at ~1 wt% of cement leads to dramatic reduction in water penetration and nearly doubles the compressive strength. We also observed a >50% increase in compressive strength [Note: The tests were performed with Portland cement. The results may vary depending on the type of cement and aggregates used. Each case has to be tested separately.]

| Designation | Water Absorption ASTM 140 | | Water penetration depth under pressure BS EN 12390–8:2000 | |
|---|---|---|---|---|
| | Value | % change | Depth (mm) | % change |
| Benchmark | 5% | | 56 mm | |
| C-SP | 1.8% | -64% | 15 mm | -73% |
| C-CGT-1 | 1% | -80% | 7 mm | -87% |

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## Conductive Paste

With the aid of proprietary surfactants, our GNP will form stable dispersions in epoxy as well as water. This solution can be used to generate conductive coatings.

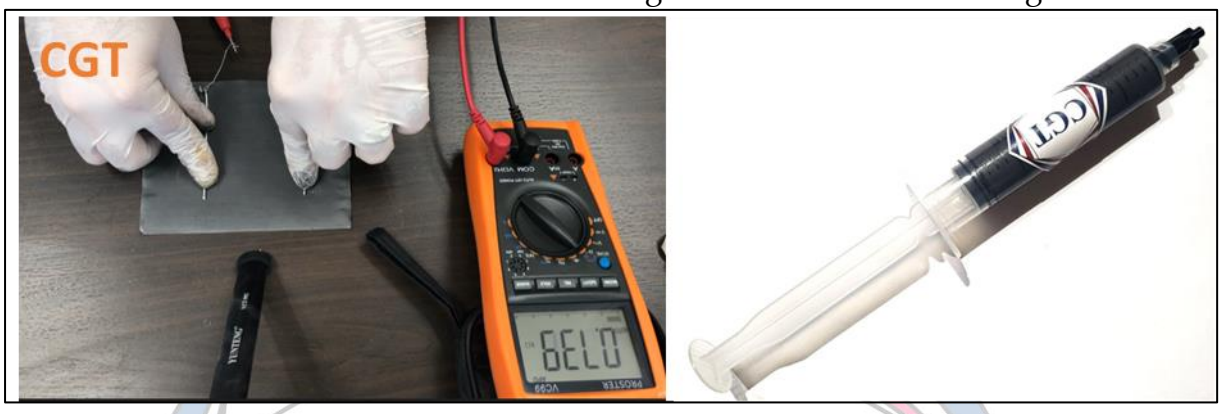


*Figure: Conductive pastes made by CGT.*

## Other Applications

The above applications are just examples of the use of our product. We are actively pursuing other applications, such as using them to toughen the rubber for tire applications, and antifouling.

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