About Cabot Corporation

A rich and unique history

Over 130 years in operation
- Founded in 1882
- NYSE: CBT since 1968

Global specialty chemicals and performance materials company
- 44 manufacturing sites in 21 countries

Core technical competencies in fine particles and surface modification

FY2016 Sales: $2.4B
Segments

Strong portfolio with leadership positions

REINFORCEMENT MATERIALS

• **Rubber blacks** tires, hoses, belts, molded goods
• **Elastomer composites** tires

PURIFICATION SOLUTIONS

• **Activated carbon** purification of air and water, food and beverages, pharmaceuticals, catalysts

SPECIALTY FLUIDS

• **Cesium formate brines** oil and gas well drilling, completion fluids
• **Fine cesium chemicals** catalysts, titanium dioxide, glass, defense, automotive brazing flux

PERFORMANCE CHEMICALS

• **Specialty carbons** toners, coatings, adhesives, sealants, electronics, batteries, inks, plastic film and sheet, fiber, plastic molding, pipes, wire and cable, conductive plastics
• **Specialty compounds** masterbatches, conductive concentrates, conductive compounds
• **Fumed metals oxides** silicones, toners, composites, adhesives, sealants, coatings, polishing slurries
• **Aerogel** building and construction, coatings, industrial insulation, specialty chemicals, subsea pipelines
• **Inkjet colorants & inks** small office, home office, commercial and industrial inkjet printing
Graphenes are “products by process”
Cabot investing in scalable technologies

- Graphite oxide (GO)-derived graphenes
- Mechanical
- Gas Phase
- Solution
- Chemical Exfoliation (GNP)
- Expanded Graphites
- Batteries
- Conductivity
- Shape
- Mechanical Barrier
- Conductivity
- Higher Aspect Ratio
- Surface Area (m²/g)
- Lateral Size
- Plastics
- Elastomers
- Coatings
Graphenes have unique morphologies that deliver performance in different applications

<table>
<thead>
<tr>
<th>Process</th>
<th>Mechanical</th>
<th>GO-derived</th>
<th>GO-derived</th>
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</thead>
<tbody>
<tr>
<td>Product</td>
<td>Graphene aggregates</td>
<td>Reduced Graphene Oxide (rGO)</td>
<td>GO nanoplatelets</td>
</tr>
<tr>
<td>Lateral size</td>
<td>&lt; 2 µm</td>
<td>&lt; 5 µm</td>
<td>&lt; 10 µm</td>
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<tr>
<td>Surface area</td>
<td>300-700</td>
<td>500-700</td>
<td>(aqueous only)</td>
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<tr>
<td>Surface chemistry</td>
<td>[O]&lt;5%</td>
<td>[O]&lt;15%</td>
<td>[O]~30%</td>
</tr>
<tr>
<td>Capabilities</td>
<td>Commercial</td>
<td>Pilot scale</td>
<td>Pilot scale</td>
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</tbody>
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We design the surface chemistry, and delivery form (powder, concentrate, dispersion) to suit the end use
Key messages

• Graphenes are a family of materials that offer multifunctional performance at low loadings.

• Cabot has invested in development of several key technologies for the production of graphenes.

• Initial adoption of graphenes in applications will be driven by applications where the value delivered greatly exceeds the cost.

• Incorporation and dispersion of graphenes drive performance. Formulated solutions containing graphenes as additives to the additives are most likely to break trade-offs.

• Toxicology of graphenes continues to be evaluated.

• Cabot is developing strong strategic partnerships to advance commercialization of these important materials in plastics, elastomers, coatings, energy storage and other high end applications.