

# PRICE SHEET

## Grat-Film™: Graphene on Copper High-quality CVD graphene films

Item Number	Size (in <sup>2</sup> )	Price (£GBP)	Product Description
Gratom-M-Cu-02	2 x 2	150	<ul style="list-style-type: none"> <li>CVD graphene on copper with <u>monolayer percentage &gt; 95%</u>, optical transmittance at 550 nm &gt; 97% (excl. substrate)</li> <li>Average Raman Id/Ig &lt; 5% within domain</li> <li>Average Hall mobility of <u>2000-4000 cm<sup>2</sup>/Vs</u> at n=1e12 /cm<sup>2</sup></li> <li>Average sheet resistance of 300-600 ohm/sq. when transferred to PMMA or PET substrate</li> </ul>
Gratom-M-Cu-04	4 x 4	500	
Gratom-M-Cu-12	8 x 10	2,500	
Gratom-M-Cu-16	12 x 14	4,000	
Gratom-R-Cu-12	8 x 10	350	<ul style="list-style-type: none"> <li>CVD graphene on copper with both monolayer and occasional multilayer islands, optical transmittance at 550 nm &gt; 95% (excl. substrate)</li> <li>Average sheet resistance of 300-600 ohm/sq. when transferred to PMMA or PET substrate</li> </ul>
Gratom-R-Cu-16	12 x 14	700	
Gratom-S1-Cu-02	2 x 2	400	<ul style="list-style-type: none"> <li>CVD graphene with isolated single graphene domain</li> <li>Average graphene domain size &gt; <u>30 μm</u></li> <li>Average Raman Id/Ig &lt; 5% within domain</li> </ul>
Gratom-S2-Cu-02	2 x 2	1,200	<ul style="list-style-type: none"> <li>CVD graphene with isolated single graphene domain</li> <li>Average graphene domain size &gt; <u>200 μm</u></li> <li>Average Raman Id/Ig &lt; 5% within domain</li> </ul>
Gratom-A-Cu-12x60	12 x 60	4,000	<ul style="list-style-type: none"> <li>Large-area, as-grown CVD graphene</li> </ul>
Gratom-A-Cu-24x60	24 x 60	7,000	
Gratom-A-Cu-24x100	24 x 100	15,000	
Gratom-A-Cu-24x300	24 x 300	55,000	

- Copper thickness 1mil (25 μm)
- Contact us for other dimensions or different copper film thickness

# PRICE SHEET

## Grat-Film™: Graphene on SiO<sub>2</sub>/Si High-quality CVD graphene films

Item Number	Graphene Size	Wafer Size	Price (£GBP)	Product Description
Gratom-M-Si1-01x4	10 mm x 10 mm (4 pack)	15 mm x 15 mm (4 pack)	150	<ul style="list-style-type: none"> <li>CVD graphene on SiO<sub>2</sub>/Si wafer</li> <li>Graphene film coverage <math>\geq 95\%</math> with occasional holes and cracks (<math>&lt; 5\%</math>)</li> <li>Monolayer graphene percentage <math>&gt; 95\%</math></li> <li># of cracks or holes larger than 3 mm: 0</li> <li>Average Raman Id/Ig <math>&lt; 5\%</math> within domain</li> <li>Average Hall mobility of 2000-4000 cm<sup>2</sup>/Vs at n=1e12 /cm<sup>2</sup></li> <li>Average sheet resistance of 300-600 ohm/sq.</li> </ul>
Gratom-M-Si1-02	35 mm x 35 mm	2" wafer	280	
Gratom-M-Si1-04	70 mm x 70 mm	4" wafer	600	
Gratom-M-Si2-01x4	10 mm x 10 mm (4 pack)	15 mm x 15 mm (4 pack)	300	<ul style="list-style-type: none"> <li>CVD graphene on SiO<sub>2</sub>/Si wafer</li> <li>Graphene film coverage <math>\geq 99\%</math> with occasional holes and cracks (<math>&lt; 1\%</math>)</li> <li>Monolayer graphene percentage <math>&gt; 95\%</math></li> <li># of cracks or holes larger than 3 mm: 0</li> <li>Average Raman Id/Ig <math>&lt; 5\%</math> within domain</li> <li>Average Hall mobility of 2000-4000 cm<sup>2</sup>/Vs at n=1e12 /cm<sup>2</sup></li> <li>Average sheet resistance of 300-600 ohm/sq.</li> </ul>
Gratom-M-Si2-02	35 mm x 35 mm	2" wafer	600	
Gratom-M-Si2-04	70 mm x 70 mm	4" wafer	1200	
Gratom-S1-Si-02	35 mm x 35 mm	2" wafer	550	<ul style="list-style-type: none"> <li>CVD graphene on SiO<sub>2</sub>/Si wafer</li> <li>Isolated single graphene domain</li> <li>Average graphene domain size <math>\geq 30 \mu\text{m}</math></li> <li>Average Raman Id/Ig <math>&lt; 5\%</math> within domain</li> </ul>
Gratom-S2-Si-02	35 mm x 35 mm	2" wafer	1,300	<ul style="list-style-type: none"> <li>CVD graphene on SiO<sub>2</sub>/Si wafer</li> <li>Isolated single graphene domain</li> <li>Average graphene domain size <math>\geq 200 \mu\text{m}</math></li> <li>Average Raman Id/Ig <math>&lt; 5\%</math> within domain</li> </ul>

- Wafer spec: thermal grown 285-nm SiO<sub>2</sub> on p-type Si substrate (resistivity  $< 0.005 \text{ ohm-cm}$ )
- Contact us directly for other specs not listed

# PRICE SHEET

## Grat-Film™: Graphene on PET High-quality CVD graphene films

Item Number	Size (in <sup>2</sup> )	Price ( 8" h)	Min. Order Quantity	Product Description
Gratom-O1-PET-02	2 x 2	70	4	<ul style="list-style-type: none"> <li>CVD graphene transferred on PET film</li> <li>Transmission of graphene at 550 nm: &gt; 95% (excl. substrate)</li> <li>Average sheet resistance: &lt; 800 ohm/sq.</li> </ul>
Gratom-O1-PET-04	4 x 4	140	3	
Gratom-O1-PET-12	8 x 10	280	2	
Gratom-O2-PET-02	2 x 2	200	4	<ul style="list-style-type: none"> <li>CVD graphene transferred on PET film</li> <li>Transmission of graphene at 550 nm: &gt; 95% (excl. substrate)</li> <li>Average sheet resistance: &lt; 300 ohm/sq.</li> </ul>
Gratom-O2-PET-04	4 x 4	200	3	
Gratom-O2-PET-12	8 x 10	500	2	
Gratom-O3-PET-02	2 x 2	Contact us for quote		<ul style="list-style-type: none"> <li>CVD graphene transferred on PET film</li> <li>Transmission of graphene at 550 nm: &gt; 93% (excl. substrate)</li> <li>Average sheet resistance: &lt; 150 ohm/sq.</li> </ul>
Gratom-O3-PET-04	4 x 4			
Gratom-O3-PET-12	8 x 10			
Gratom-O4-PET-02	2 x 2	Contact us for quote		<ul style="list-style-type: none"> <li>CVD graphene transferred on PET film</li> <li>Transmission of graphene at 550 nm: &gt; 90% (excl. substrate)</li> <li>Average sheet resistance: &lt; 70 ohm/sq.</li> </ul>
Gratom-O4-PET-04	4 x 4			
Gratom-O4-PET-12	8 x 10			
Gratom-O5-PET-02	2 x 2	Contact us for quote		<ul style="list-style-type: none"> <li>CVD graphene transferred on PET film</li> <li>Transmission of graphene at 550 nm: &gt; 85% (excl. substrate)</li> <li>Average sheet resistance: &lt; 30 ohm/sq.</li> </ul>
Gratom-O5-PET-04	4 x 4			
Gratom-O5-PET-12	8 x 10			

- PET thickness 5 mil (125 micron), transmittance 87% @ 550 nm
- Contact us for other dimensions or customized products