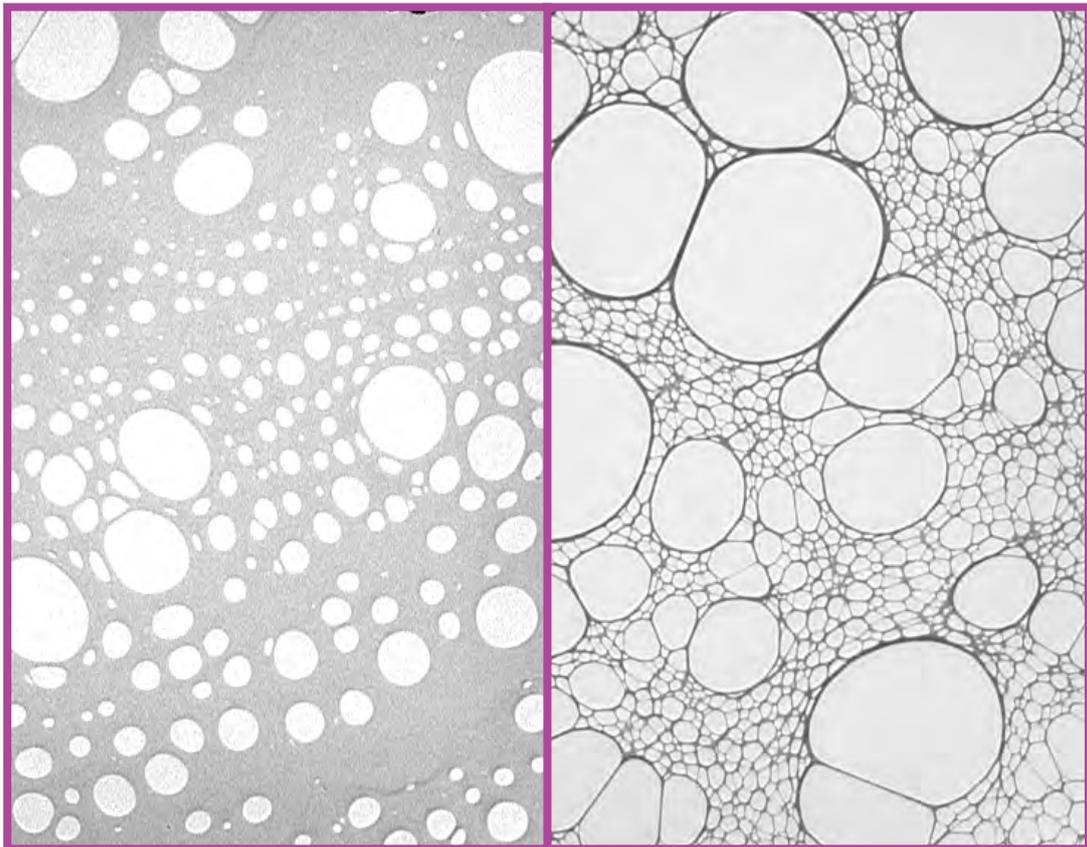


**EM RESOLUTIONS**  
Supporting Electron Microscopy

# Carbon support films

## Coated grids

- get the best from your TEM



**Holey and Lacey Carbon films**

**Continuous carbon, Formvar/Carbon, Formvar only**

**Graphene oxide**

# EM RESOLUTIONS LTD manufactures a range of carbon support films / coated grids for various TEM applications.

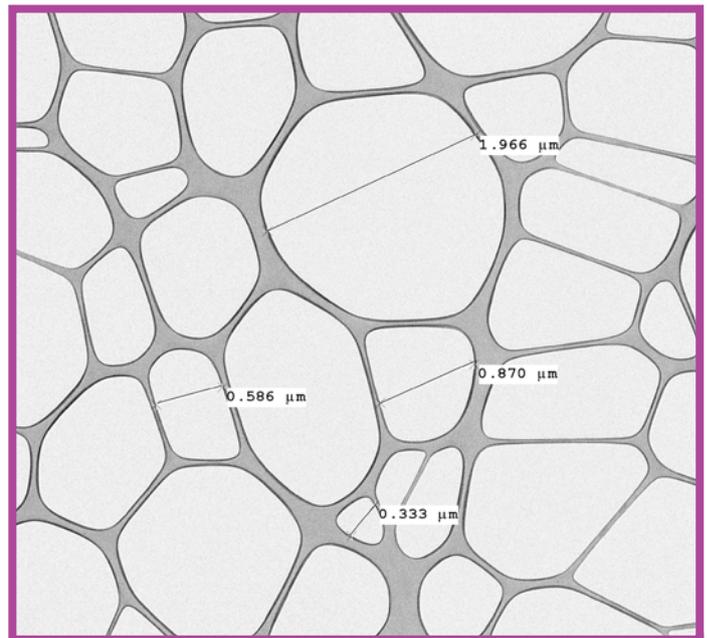
Holey and Lacey Carbon support films with varying hole sizes offer a cost effective solution where a continuous film is not desirable. They are particularly suited for suspensions of nano and virus like particles for cryo-TEM. Lacey Carbon supports are particularly strong and ideal for specimens requiring more rigorous pre-treatments.

For demanding applications thin layer Graphene oxide (GO) on lacey carbon films are an ideal alternative, for which we carefully select grids with optimum hole size for this application.

We can supply films on a wide variety of grids; Cu, Au, Ni, Al, including finder grids. Other grid types and sizes are available on request.

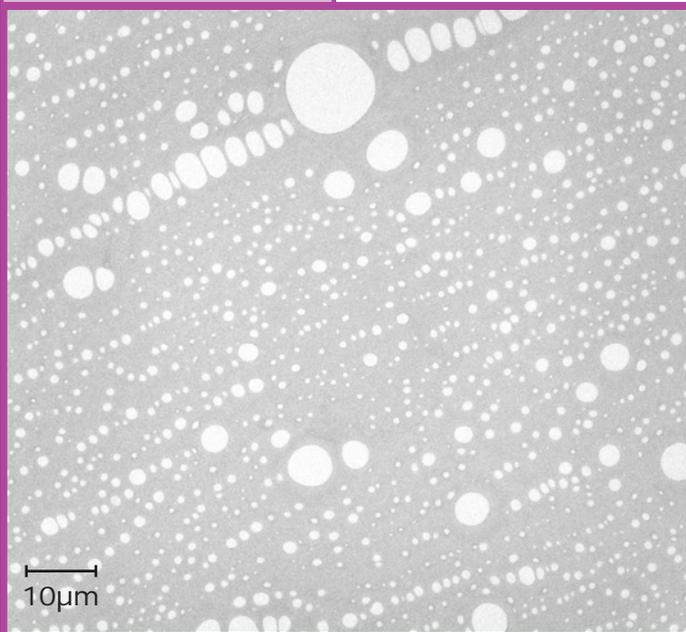
Before packing all grids are checked with an optical microscope as part of our quality process. Each box of our support films has a batch number and date code enabling batches to be tracked and a high level of quality to be maintained.

Our experience of developing methods over 30 years enables us to have greater control over the formation of the holes. We welcome feedback from our users. If you need a particular hole size or would prefer slightly thicker or thinner films then please tell us and we can modify future orders to your requirements.

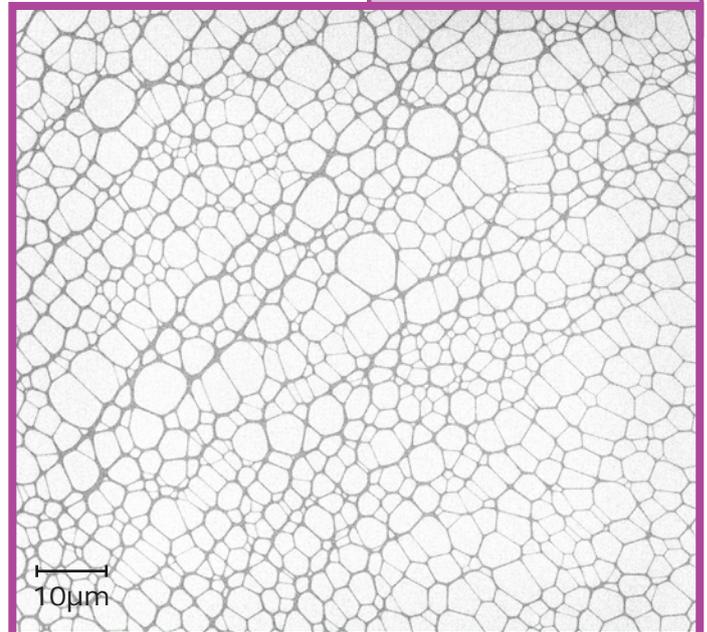


Both Holley and Lacey carbon support films provide a range of hole sizes

Holey carbon support film



Lacey carbon support film



# Handling instructions for Carbon support films

**Holey and Lacey films are always on the shiny side of the grid.**

**Continuous carbon and carbon formvar are on the dull side of the grid.**

The use of Dumoxel tweezers is recommended when handling grids with support films. Their anti-magnetic properties reduce the risk of damage during handling. We particularly favour the use of the cross-over type. *Those who have not used this type before may find them initially awkward but persistence pays off.*

It is always best to use freshly made support films to reduce the risk of them coming into contact with potential sources of contamination. When not in use we recommend that grid boxes are stored in a cool, dark and dry place. Ideally they should be used within 3 months of manufacturing date. Extremes of temperature should be avoided.

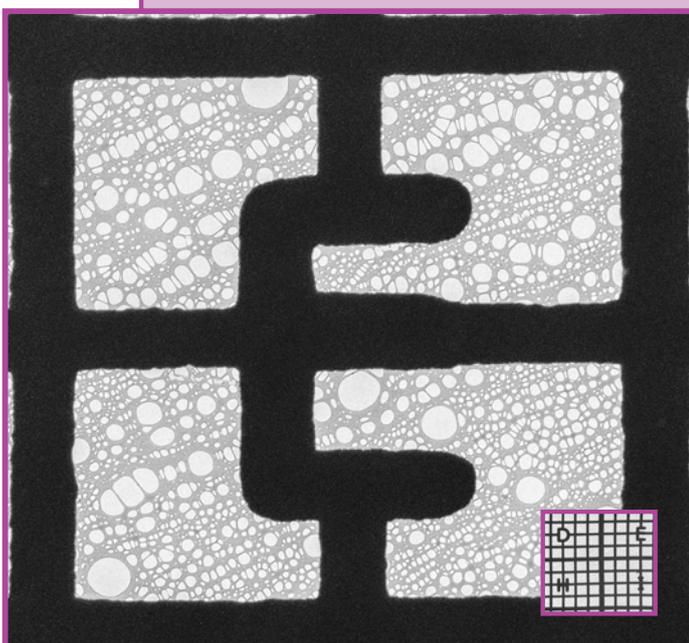
The most popular mesh sizes are 200, 300 and 400. During manufacture some grid squares may split. This is an inherent yet manageable issue in the process. For support films on 200 mesh grids a maximum of 5 split grid squares is deemed to be acceptable. For a 400 mesh grid 10-12 split grid squares is tolerable.

When assessing support films, particularly from a new supplier there are several artefacts that one should look out for:

1. The quality of the original grid is very important and should not have spikes on the bars that can cause films to split. These are observable in some Cu and Au grids. EM Resolutions checks for this and rejects these batches.
2. Grids should be free of contamination from the grid making process. Some grid manufacturers use release agents to remove the grids from the backing plate, leaving a thin film on the grid. This can result in support films separating from the grid or becoming unstable when viewed in the TEM.
3. Contamination can result from insufficient removal of the polymer support film after carbon coating or from carbon contamination during the coating process. EM Resolutions uses turbo molecular pumps in our coating systems.



Support films are also available on Finder grids



**EM Resolutions Ltd** offers a choice of grid boxes. White grid boxes are the most popular as it is easier to see the grids in the box. They are also preferable for longer term storage as they are less prone to volatile components from the polymer contaminating the grids.

### Holey & Lacey Carbon Films

| Support Film | Grids  | 200 mesh | 300 mesh | 400 mesh |
|--------------|--------|----------|----------|----------|
| Holey Carbon | Copper | HC200Cu  | HC300Cu  | HC400Cu  |
|              | Gold   | HC200Au  | HC300Au  | HC400Au  |
|              | Nickel | HC200Ni  | HC300Ni  | HC400Ni  |
| Lacey Carbon | Copper | LC200Cu  | LC300Cu  | LC400Cu  |
|              | Gold   | LC200Au  | LC300Au  | LC400Au  |
|              | Nickel | LC200Ni  | LC300Ni  | LC400Ni  |

### Formvar/Carbon & Carbon Films

| Support Film   | Grids  | 200 mesh | 300 mesh | 400 mesh |
|----------------|--------|----------|----------|----------|
| Formvar/Carbon | Copper | FC200Cu  | FC300Cu  | FC400Cu  |
|                | Gold   | FC200Au  | FC300Au  | FC400Au  |
|                | Nickel | FC200Ni  | FC300Ni  | FC400Ni  |
| Carbon         | Copper | C200Cu   | C300Cu   | C400Cu   |
|                | Gold   | C200Au   | C300Au   | C400Au   |
|                | Nickel | C200Ni   | C300Ni   | C400Ni   |

### Formvar Only Films

| Support Film | Grids  | 200 mesh | 300 mesh | 400 mesh |
|--------------|--------|----------|----------|----------|
| Formvar      | Copper | F200Cu   | F300Cu   | F400Cu   |
|              | Gold   | F200Au   | F300Au   | F400Au   |
|              | Nickel | F200Ni   | F300Ni   | F400Ni   |

Please note: The above part numbers are for packs of 50. If you require a pack of 25 or 100 please add the quantity after the part code e.g. F200Cu100, HC300Ni25.



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**EM**Resolutions Ltd was founded in 2012 and has been supplying high quality TEM support films and calibration standards to EM laboratories and consumables companies throughout the UK and the rest of Europe. Our technical staff have over 50 years combined experience, learned under the expert guidance of Alan Agar, one of the pioneers of consumables and accessories for electron microscopy.