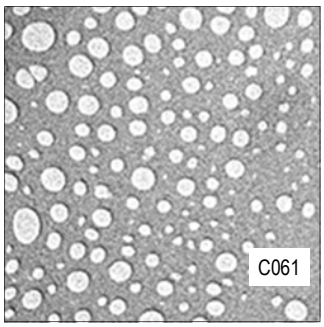
TEM Standards for Resolution & Magnification

Perforated Carbon Films



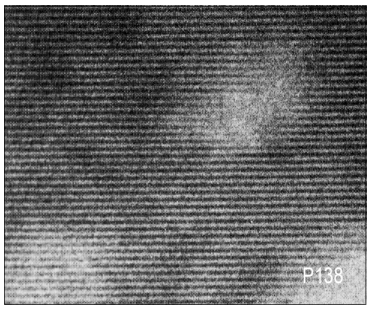
A carbon film containing many small holes of various sizes mounted on a 400 mesh 3mm Ø grid, used for correcting astigmatism and for checking the performance of the electron microscope. It is one of the quickest and easiest ways to check microscope resolution. The holes are circular with smooth edges.

C061 Perforated carbon film each

Lattice Plane Specimens

Crystal lattice plane specimens provide two measurement checks. They give a good test of microscope stability and as the spacing of the lattice is accurately known from X-ray measurements, they provide a calibration of magnification in the upper range of microscope magnification.

Copper Phthalocyanine

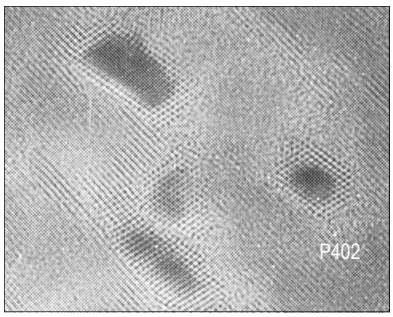


Plane spacing 1.0nm

Well documented in the literature for TEM the spacing gives a convenient test but the specimens are beam sensitive and quickly lose their crystallinity under the electron beam.

P138 Copper phthalocyanine on 3mm grid each

Chloro-Copper Phthalocyanine

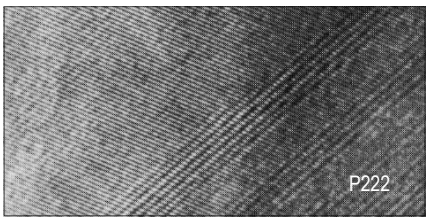


Plane spacing 1.75 and 1.3nm

More irradiation resistant than copper phthalocyanine and therefore better for the visualisation of lattice planes. The sample must be tilted at 26.5° to the horizontal to reveal the spacings. Owing to preparation difficulties with this specimen the grid coverage is fragmentary and normal grid coverage is *not* achieved.

P402 Chloro-copper phthalocyanine crystals on 3mm grid each

Crocidolite

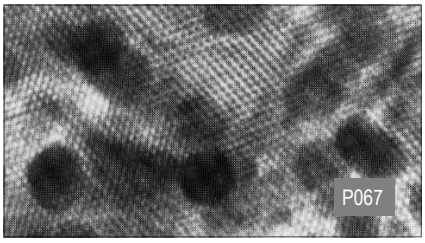


Plane spacing 0.9nm and 0.45nm

The 0.9 spacing (020) is oriented along the axis of the crocidolite fibres. The 0.45 spacing appears at an angle of about 60° to this in suitable crystal orientations

P222 Crocidolite on 3mm grid each

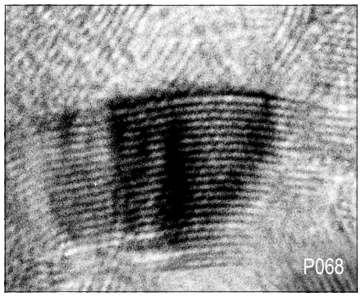
Potassium Chloroplatinate



Plane spacing 0.56nm

P067 Potassium chloroplatinate crystal on 3mm grid each

3 EM Calibration Standards



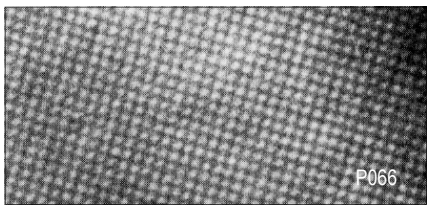
Graphitised Carbon Black

Plane spacing 0.34nm

Graphitised carbon black is stable and highly reproducible and is a popular standard resolution test for TEM's.

P068 Graphitised carbon black on 3mm grid. each

Single Crystal Gold Foil

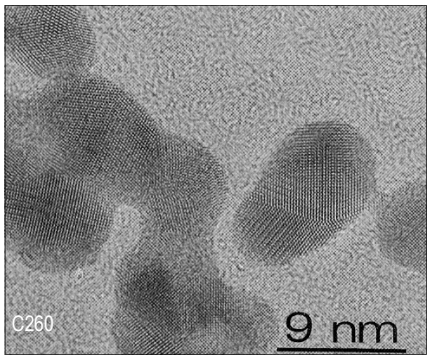


Plane spacing 0.204nm, 0.143nm and 0.102nm

Higher resolution TEM's can be checked for resolution, image quality, magnification and instrumental stability by setting up the conditions for imaging 0.204nm, 0.143nm and 0.102nm planar spacings in these specially prepared crystals. The tests are particularly recommended if height adjustments are made on the specimen stage.

P066 Oriented single crystal gold foil on 3mm gold grid each

High Resolution TEM Test Specimens



Gold Particles on Carbon Film

Finely dispersed thin gold particles for tests of high resolution imaging capabilities of TEM's giving some advantages over Single Crystal Gold. The checking of image quality, magnification and instrumental stability can all be readily undertaken, but for the determination of resolution this gold particle specimen is superior since it offers a choice of crystalline orientations on static or low tilt stages. In addition the thickness of the crystalline material is easily calculated from the projected shape of the gold crystal.

C260 High resolution test specimen gold on carbon 3mm grid each

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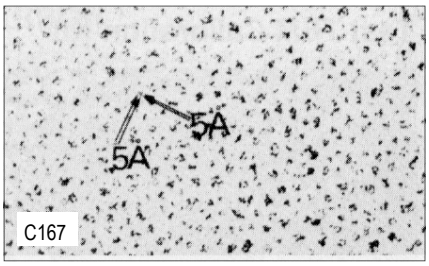
Evaporated Platinum/Iridium

Evaporated platinum/iridium on a perforated carbon film. The support film provides holes for ease of focus and astigmatism correction. The grains of evaporated metal provide dense particles for resolution checks by the particle separation test

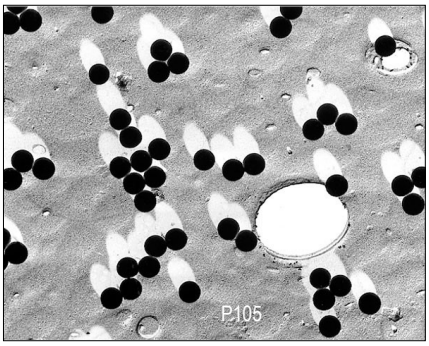
C167 Platinum/Iridium on perforated carbon on 3mm grid each



Shadowed Polystyrene Latex Particles

Shadowed latex particles of 0.216µm Ø provide dense markers and at the edges of the metal shadowing small metal aggregates may be found for particle separation resolution checks.

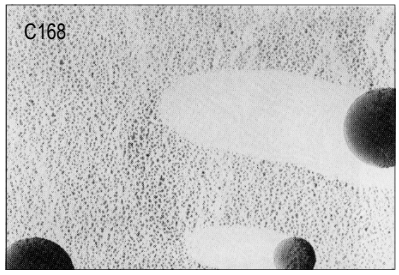
P105 Polystyrene latex beads 0.204µm Ø shadowed with palladium/platinum alloy on 3mm grid
P105/1 As above with beads 0.12µm Ø
P105/2 As above with beads 0.945µm Ø



Gold Shadowed Latex

Heavily gold shadowed latex particles 0.22µm Ø on a carbon film. The gold forms islands of strongly scattering material and produces a test object suitable for **STEM.**

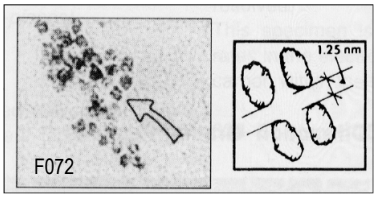
C168 Gold shadowed polystyrene latex particles on 3mm grid each



Ferritin

Some ferritin molecules display a quad structure with a separation of 1.25nm. This is useful as a resolution check. The ferritin is dispersed on a formvar/carbon substrate.

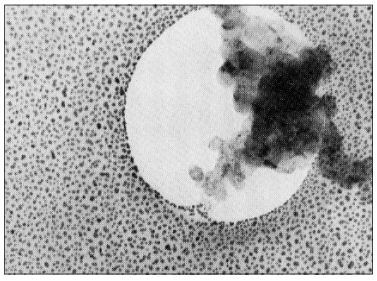
F072 Ferritin on 3mm grid each



Combined Test Specimen

A perforated carbon film is shadowed with gold onto which graphitised carbon particles are deposited. These particles viewed over the holes may be used to assess factors limiting microscope performance. The evaporated gold forms small polycrystalline islands and within these islands, lattice fringes can be resolved.
This specimen can also be used for the **measurement of contamination rates in the electron microscope** by noting the deposition rate of carbon within the holes found in the gold film.

S529 Combined test specimen on 3mm grid each

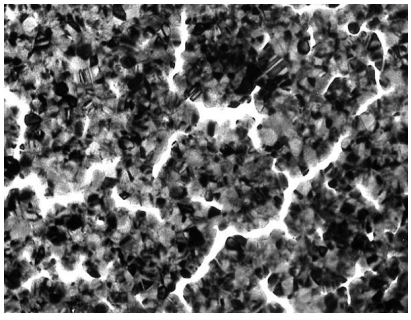


S529

HVEM Standard

Low contrast on the viewing screen makes normal test specimens difficult to see in the HVEM. These specimens are grids coated with a thick layer of evaporated gold which forms crystallites containing lines of strong diffraction contrast. These are of different spacings allowing the performance to be checked at various levels.

S530 HVEM test specimen, evaporated gold on 3mm grid each



S530