

## EM-Tec Clear Cellulose Acetate Replication Film

Product # 15-006050, 15-006075, 15006125

### Introduction

Cellulose acetate film is a superior material for making replicas of acetone resistant surfaces such as metals and ceramics. It is particularly useful when a surface cannot be directly examined. Cellulose acetate films are sturdy, pliable and the replicas are self-supporting with good spatial stability. Cellulose acetate is readily dissolved in acetone or methyl acetate. Cellulose acetate film softened with acetone, correctly replicates the surface structure which it is applied to. The replica films are easily separated from most surfaces. The replicas can be examined with LM, SEM and TEM.

### Instructions for making negative replicas

- 1 – Clean surface; see note 1
  - 1 – Cut cellulose acetate film size to cover a larger area than the surface to be replicated
  - 2 – Apply several drops of acetone on the sample surface
  - 3 – Spread the acetone over the sample surface; see note 2
  - 4 - To avoid bubbles, apply the cellulose acetate film from one end and let surface tension pull the film onto the surface
  - 5 – Do not apply pressure and let the acetone evaporate (allow 10 minutes)
  - 6 – When dry, the replica is carefully stripped from the sample surface by using tweezers or adhesive tape
- Note 1: A replica must be clean of any contamination. To clean the sample surface, replicas can be made to pick up any particle and discarded.
- Note 2: An alternative method to steps 3 and 4 are: soften one side of the cellulose acetate film with acetone and apply the softened side on the sample surface.

### Instructions for making negative replicas for SEM

- 1 – Mount the replica, structure side up, on a suitable SEM mount using carbon or silver paint at the edges only.
- 2 – Coat the replica evenly with gold, gold/palladium or platinum in a sputter coater.
- 3 – Coated negative replica can now be examined in the SEM or with LM

### Instructions for making positive replicas

- 1 – Mount the replica, structure side up, to a glass microscope slide using polyimide (Kapton) tape
  - 2 – Place the mounted replica in a high vacuum carbon/metal evaporation system and coat the replica a low angle with platinum, platinum/palladium or Iridium (shadowing)
  - 3 – Coat the replica evenly with carbon at an angle of 90 degrees to the surface.
  - 4 – Take the coated and shadowed replica and cut 2mm squares of the areas of interest with a sharp razor blade or scalpel.
  - 5 – Place the replica, cellulose acetate side down, on a TEM grid
  - 6 – Dissolve the cellulose acetate by placing the TEM grid with replica in a washing device with acetone; see note 3
  - 7 – Keep TEM grid wet and move grid to clean area to dissolve cellulose acetate completely
  - 8 – Remove TEM grids from washing device and let dry
  - 9 – Examine positive replica with TEM where the shadowed features provide contrast.
- Note 3: A suitable washing device is filter paper in a petri dish with cover. Keep filter paper wetted with acetone during washing cycle

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