



Polishing Kit

User Manual



2I-04000 Issue 5

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1. Introduction

The Specac Polishing Kit P/N GS04000 contains the equipment you need to help clean and repolish window surfaces to within a few fringes of flatness.

The window materials that will most be suitable for working to a repolished finish are NaCl and KBr. Due to their nature, they are both softish window materials and are readily affected by a moist aqueous environment. Use of these principles allows for easy initial abrasion of the window surface and then subsequent repolishing to a flat surface with a suitable abrasive paste mixture of the polishing rouge powder (alumina) and solvent (usually methylated spirits or similar).

Harder window materials, typically such as CaF₂, BaF₂, ZnSe and Quartz (fused silica) that are aqueous tolerant, may not lend themselves to being abraded prior to surface repolishing. Any blemishes or marks introduced to the window surface, (which is necessary for the repolishing procedure with NaCl and KBr windows), may not be easily removed by subsequent polishing. Specac can only suggest that use of the polishing Selvyt self adhesive cloth paper, when affixed to the polishing lap glass plate with a paste powder of the polishing rouge and distilled water, may be suitable for removing surface film contamination on these harder window materials. The abrasive lapping paper material, as affixed to the smoothing lap glass plate for roughing up the window surface, should be avoided.

2. Unpacking and Checklist

The Specac Polishing Kit will be provided in its own carry case.

Please check that the following have been supplied:

- 1 Smoothing lap (glass plate 150mm x 100mm x 12mm).
- 1 Polishing lap (glass plate 150mm x 100mm x 12mm).
- 1 Polyethylene bottle for containment of methanol or similar alcohol. (e.g. ethanol)
- 1 Bottle of polishing rouge (approx 75g nett).
- 1 Sponge.
- 1 Optical flat (glass plate 76mm x 76mm x 12mm).
- 1 Cleaning cloth (6" x 6").
- 1 Packet of 6 spare abrasive lapping papers for smoothing lap.
- 1 Packet of 6 Selvyt, self adhesive cloths for polishing lap.
- 2 Brushes.

3. Instructions for Use

Grinding and Smoothing

If the window is to be made from blank material or it is very badly scratched it should first be ground on the smoothing lap, which has an abrasive lapping paper surface. (Fix one of the self adhesive abrasive lapping papers to one of the glass plates (150mm x 100mm x 12mm) to create the smoothing lap plate). The purpose of grinding and smoothing the window surface is to try and obtain a uniform "rough" surface prior to polishing to a flat finish over the whole surface area of the window.

Note: Any window material other than NaCl or KBr may be irretrievably damaged by a grinding and smoothing process due to the hardness and nature of the particular window material.

To grind and smooth a window, use a mixture of circular and straight movements changing the position of the windows between the fingers frequently. Do not allow a build up of salt on the lap as this could damage your surface on the window. Use one of the brushes to clear the salt away. The other side of the window is then ground similarly if necessary.

After grinding and smoothing of the window, it will be found that some of the salt crystals cannot be brushed away from the lapping paper. This is easily overcome by placing the smoothing lap surface under running water, using one of the brushes and then allowing the plate to dry. It is most important to let the abrasive paper dry before further grinding. Please note the abrasive paper is completely waterproof.

Polishing

The polishing lap plate is prepared by fixing one of the six self adhesive Selvyt cloths to the polishing lap (the second 150mm x 100mm x 12mm glass plate). Peel the protective paper from the back of the Selvyt cloth exposing the adhesive. Make sure that the smoothing lap plate surface is clean, then apply the adhesive side of the Selvyt to the glass plate, making sure it is lying flat and not wrinkled. Add a little polishing rouge to the lap and a few drops of alcohol to keep the Selvyt slightly damp. If possible keep a portion of the Selvyt dry and free from rouge so that the window may be drawn across this portion when it is being removed from the lap.

Polish using circular and straight movements and rotate the windows between the fingers often. A window ground on the smoothing lap surface, (being slightly concave) will become more and more flat as polishing proceeds. If polishing is carried to excess the edges of the window will polish away too much and so the window will become progressively convex. Therefore, regularly test the flatness of the window by pressing against the optical flat (76mm x 76mm x 12mm glass plate) so that polishing is discontinued as soon as the desired flatness is obtained. With reasonable care a window may be polished flat to 5 or 6 fringes in less than one minute.

Whenever the window is removed from the polishing lap plate it must be immediately drawn across the Selvyt strip to dry it. Make sure that the optical flat and the windows are as clean and free from dust as possible, otherwise the window will get scratched. A good way of getting rid of dust is to place a piece of tissue paper between the two surfaces and while maintaining a slight pressure on the upper plate (the window) to draw the tissue paper away.

The self adhesive Selvyt cloth can be removed from its polishing lap plate and thrown away when it becomes dirty and worn. After removal the polishing lap plate surface must be cleaned before a new Selvyt cloth is fitted.

A pattern of 8 to 10 fringes and a parallelism of 0.001"/inch will be found adequate for most cell windows. In counting interference fringes, care should be taken that any fringes, which are circular, are not counted twice. To see fringes between the optical flat and the windows, a monochromatic or fluorescent light source should be used.

Precautions

- 1) Wear rubber gloves when handling any window material.
- 2) Do not polish NaCl or KBr windows under conditions of excessive humidity.
- 3) Work in a dust free atmosphere.
- 4) Keep the polishing kit clean and free from oil, dust and grit.
- 5) Salt windows are soft and fragile so be gentle in grinding and polishing.
- 6) Store any polished windows in a desiccator.

4. Spares for the Polishing Kit

Parts

P/N GS04000 Specac Polishing Kit complete.

P/N GS04010 Polishing Kit polishing Selvyt adhesive pads
(packet of 5).

P/N GS04040 Polishing Kit polyethylene bottles (packet of 2).

P/N GS04050 Polishing Kit cleaning sponges. (packet of 2).

P/N GS04060 Polishing Kit bottle of polishing rouge (approx 75g nett).

P/N GS04080 Polishing Kit cleaning cloths. (packet of 2).

P/N GS04090 Polishing Kit abrasive lapping paper (packet of 5).

P/N GS04095 Polishing Kit brushes (packet of 2).

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