

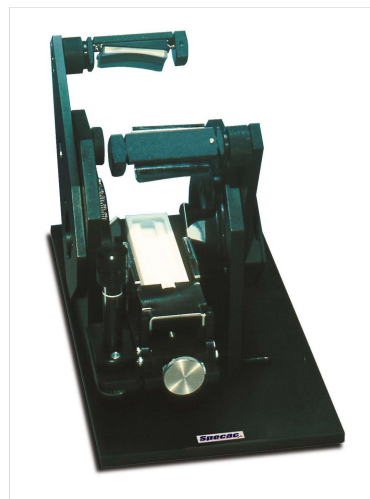


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Realignment of Monolayer Grazing Angle Accessory P/N GS19650

From installation of the Specac monolayer grazing angle accessory P/N GS19650 into a spectrometer sample compartment, if there is no signal throughput registered when the reference reflectance mirror is in position on the sampling platform and the "butterfly arms" have both been set to the same incidence angle (nominally 45°), then it is possible either one or both of the adjustable mirrors at the end of the butterfly arms is/are not correctly aligned.

A monolayer grazing angle accessory will have been roughly aligned for a throughput before leaving Specac as new, but it needs to be finely tuned to best match the local environment within a specific spectrometer. If it is believed that the adjustable mirrors are not sending a signal correctly to and from the sampling area, you will need to recreate a beam path to and from the sample cup area to realign the mirrors using a source of visible light.



Outside and away from the spectrometer sample compartment, place the monolayer grazing angle accessory on a flat surface. Have the solid sampling platform assembly fitted into the accessory and ensure that the platform's surface height is exactly level with a beam of light that would be running straight through the accessory over the central sample area line (marked on the platform) if the light beam deflecting mirrors at the base of the butterfly arms were not present. The height of the solid sampling platform surface is adjustable by the rotatable screw mechanism as part of the complete sampling platform assembly.

Set both butterfly arms to a nominal angle of 45° and fix them into position. Do not be concerned with position of the movable mirrors on the butterfly arm at this stage.

Use a bright white light source beam (white light from an LED torch masked to a circle aperture of circa 10mm diameter is good) in a darkened environment to project a beam of light to the angled, fixed, square mirror at the base of one of the butterfly arm assemblies fixed at the 45° angle. Ensure that the light beam image falls onto the centre of this first fixed mirror. It is also crucial that the light beam source passes in a parallel line in relation to the base of the accessory towards the first fixed mirror. The light will be reflected from the first fixed mirror towards the centre of the movable mirror at the end of the angled butterfly arm if the initial light source is correctly positioned for its overall beam height and parallel spatial positioning.

Now adjust the movable mirror at the end of the butterfly arm for its **rotation** to direct the light beam towards the centre line of the sampling platform surface. You are looking to achieve an elliptical pool of light to cover this centre line position, such that the centre line acts as a bisecting diameter for two semi-circular pools of the light. Rotational movement of the mirror allows for central positioning of the incident angle light beam in a longitudinal direction across the sampling surface, but to centralise the beam of light now from the side to side direction, the **tilt** grub screw of the movable mirror is adjusted accordingly.

When the white light beam spot has been established in the centre of the sampling platform area after passage through one of the butterfly arm assemblies set at a 45° angle from rotational and tilt adjustments of the movable mirror (which can be considered the light input beam side to the sample), repeat the process after **moving the light source to the other side of the monolayer accessory** (the output light beam side away from the sample). This is to project the light back through this second butterfly arm assembly via the adjustable mirror to the central area of the sample platform. Centralisation of the spot of light from this direction is achievable from rotation and tilt of the adjustable mirror, provided the input source of light in the backwards direction is at the correct height, parallel positioned spatially and centred on the fixed, square mirror of this butterfly arm assembly.

When this centralisation of the beam spot onto the sampling platform area has been achieved from both butterfly arm directions you should now have roughly aligned the movable mirrors such that a beam of light brought to the sampling area from installation of the accessory into a spectrometer and fitting of the reference mirror onto the platform surface will complete an IR radiant beam of light passage from source to sample to detector. There will be an energy level signal registered at the detector of the spectrometer from this rough alignment procedure.

When installing the monolayer accessory into the spectrometer for **a fine alignment** that will be required now for an optimum energy throughput of the accessory, ensure that the reference mirror when fitted to the sampling platform is adjusted to its correct height for the reflecting surface. Therefore the sampling platform will need to be lowered by the same thickness as the reference mirror for a correct sample surface level to achieve an optimum energy throughput level.

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