

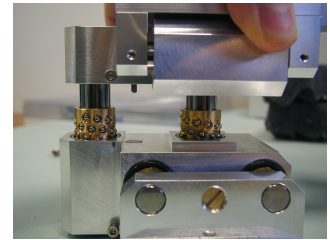
# Installation on Beamline with Microdiffractometer

## 1. Preparation

- a. Clear sufficient working space in experimental hutch
  - i. Leave microscope on table
- b. Assemble all components as in Appendix A
- c. Remove Oxford cryohead and place in holder
  - i. Record current position

## 2. Mount microspec

- a. Remove goniometer head carefully
  - i. 3 allen screws
  - ii. smart-head cabling can remain connected
- b. Unmount lenses from stage
  - i. Remove springs (x2) and slide out support
  - ii. Take care not to drop bearings
- c. Mount microspec stage on minidiffractometer
  - i. Note that bolts must be positioned flush to minidiff backplate prior to tightening
  - ii. Tighten bolts making sure that stage engages on mounting bar
- d. Attach lenses
  - i. Move stage along the horizontal axis as far to the right (away from the gonio) as possible to allow maximum clearance.
  - ii. It may still be necessary to translate the gonio in MxCube
  - iii. Locate 2 Mahr bearings onto microspec rods
  - iv. Engage lens assembly into stage ensuring bearings allow complete range of movement
  - v. Note that lenses are **unsecured** at this point!
  - vi. Attach two springs connecting stage and lens assembly
- e. Remount goniometer head
  - i. Gently tighten the 3 allen screws. Overtightening will damage the alloy cone underneath
- f. Position cryostream to accommodate microspec
  - i. If at all possible, do not reposition the cryo
  - ii. If it is necessary then make sure you reference the current position so that it can be returned to its original state



## 3. Setup other components

- a. Position DH-2000 lamp close to minidiff on gonio side
- b. Position HR2000 adjacent to lamp
  - i. Connect RS232 to lamp for remote shutter control
  - ii. Care should be taken that there is no heat transfer from lamps
- c. Position PC adjacent to HR2000
  - i. Find nearest available Ethernet port
  - ii. Connect power supply
  - iii. Connect security device

- iv. Connect USB to HR2000
- v. Login as 'microspec'
- vi. No password required
- d. Connect fibre optics noting size and UV rating
- e. Turn on Halogen lamp only, boot PC
- f. Connect PC to Ethernet port and configure network connection
- g. Run OOIBase32 and confirm that VNC Server is running

#### 4. Alignment lens to lens

- a. Make sure glass filters are installed in both lenses
  - i. Without these the focal spot will move
  - ii. They must be orientated so that the glass is closest to the fibre optic
- b. Open shutter and set integration time
- c. Optimise signal
  - i. Unscrew 4 large bolts by ¼ turn
  - ii. Adjust x and y position
  - iii. Lock large bolts
  - iv. Focal point (lens to lens distance) should be stable but can be checked by positioning thin paper in path, focusing to smallest spot, then swapping source fibre to other lens. Adjust using screw rings but note that alignment position will change on tightening.

#### 5. Alignment of lenses to beam

- a. Mount pinhole
- b. Centre pinhole in using camera and 3 click centering, low then high zoom
- c. Pinhole should now be centred relative to camera crosshairs (X-ray beam)
- d. Orientate foil to horizontal and set dial to 0
- e. Switch off hutch light and position spot close to pinhole
- f. Use camera at 45 deg to centre beam in pinhole
- g. Monitor signal through pinhole at 0 deg, and 180 deg and adjust as necessary. Note that x, y and z are not all independent as light path is at 45 deg relative to stage translation bearings.

#### 6. Remote control of PC

- a. Confirm laptop has network connection in exp hutch, run VNC server
- b. Confirm laptop power settings are set to 'Microspec' (ie. won't hibernate during data collection)
- c. In control cabin run VNC Viewer on any networked PC
- d. Open: id14tmp6.esrf.fr Password: karen
- e. May need to reboot occasionally
- f. Synchronise time clock with beamline

#### 7. Align X-ray beam (see Doc 2)

#### 8. Alignment test

Mount loop of glycerol, monitor visible spectrum, shoot xray beam, bleach focal spot with microspec.