

How to use PF-2-1 lapping and polishing fixture with micrometer:

Please be familiar with main components on the fixture shown in Figure 1 before operation, and then follow the instruction to operate it step by step

(1) Components on the Fixture

- a ---- First force weight, 10.1 Oz
- b ---- Second force weight, 6.6 Oz
- c ---- Locking screw
- d ---- Micrometer dials screw
- e ---- Micrometer mount
- f ---- Specimen holder
- g ---- Housing
- h ---- Central rod locking nut (Fig.3)

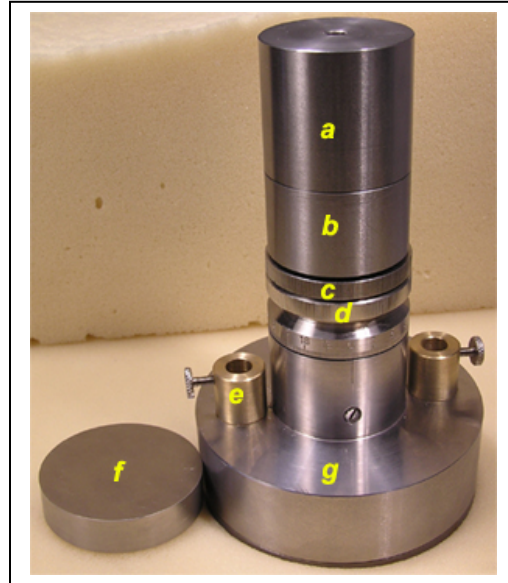


Fig.1 Overall view of PF-2-1 lapping and polishing Fixture



Fig. 2 Take off the first force weight (part a) from the second force weight (part b)



Fig. 3 Take off the second force weight (part b) from central rod locking nut (part h)

- Under the second force weight (part b) there is a central rod locking nut ass (**part h**) shown in figure 3, which connects and locks the sample holder with central rod (**part J**).
- In order to take off the central rod, you need unscrew the locking rod assembly (**part h**) in figure 4 and loose the setting screw (**part i**) by a screw driver as shown in figure 5.
- Then, lift housing up straightly (Figure 6), and separate housing from the central rod (**part j**) in Figure 7.



Fig. 4 Remove locking rod assembly (part h)



Fig. 5 Loose setting screw (part i) which lock the rod (part j)



Fig. 6 Lift up the housing straightly



Fig. 7 Take off the housing from the rod (part j)

- Please place the housing on a flat and clean surface and loss screw the central rod from the sample holder (**Part f** in Fig 8).
- (**Part d**) is a lapping removal setting screw with 0.1 mm dial dividend (Fig 9).
- There is a position pin on the inside housing top to keep sample holder together with housing during lapping (Fig10).
- Three hard alloy bases are weld to bottom of housing to reduce wearing and to keep sample flat and parallel when lapping.
- Figure 11 shows all parts in the fixture as a summary.

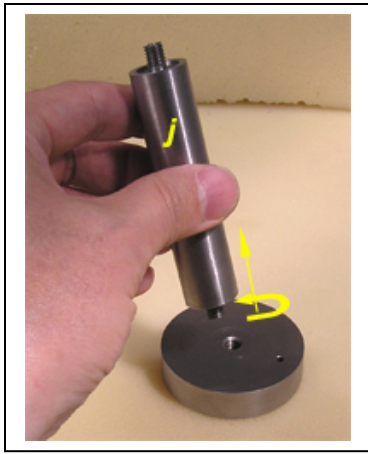


Fig. 8 Take off the central rod (part j)



Fig. 9 Remove setting scale on micrometer dials screw (part d)

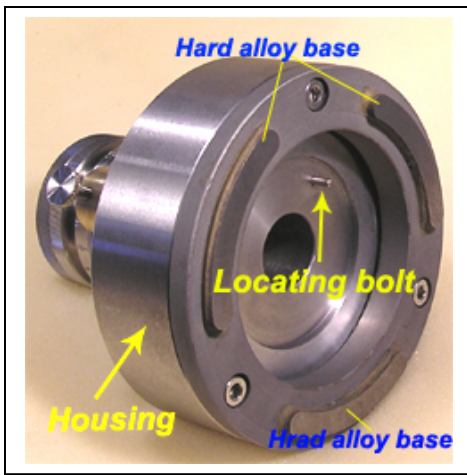


Fig. 10 the bottom view of the fixture



Fig. 11 Separating parts of the fixture

- Figure 12 shows two sides on the sample holder. One surface is for mounting sample for lapping or polishing, and another one is for connecting to central rod. The small hole in the holder must match with position pin on the housing.

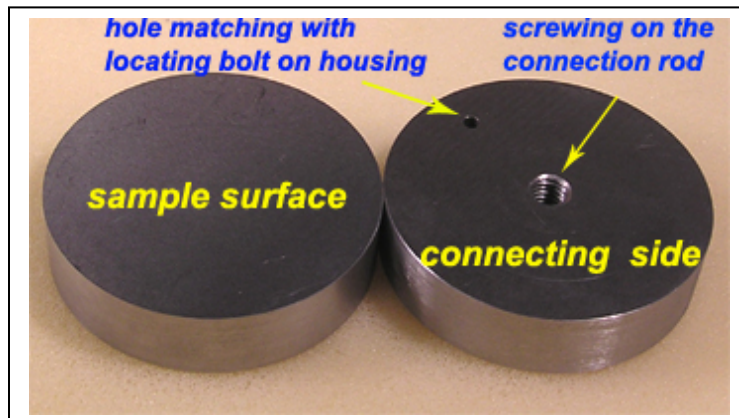


Fig. 12 the both sides view of sample holder

(2) How to mount sample to the holder.

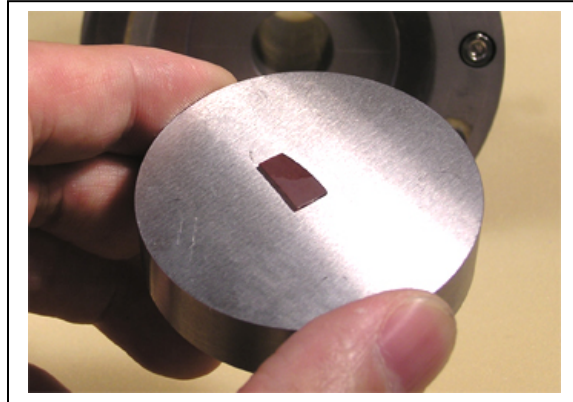


Fig. 13 mounting a piece of sample on the surface of sample holder by wax

- The sample holder can accept flat sample only with Max. diameter 2" and Max. thickness of 2mm.
- A flat sample can be fixed to sample holder by low melt point wax via a heating plate. (Fig 13). You may use a flat glass sheet to press the sample during the wax melting and cooling to keep sample parallel to the surface flat of the holder.
- After Wax cold, put sample holder back to the housing of fixture from Fig 14 to Fig 19.

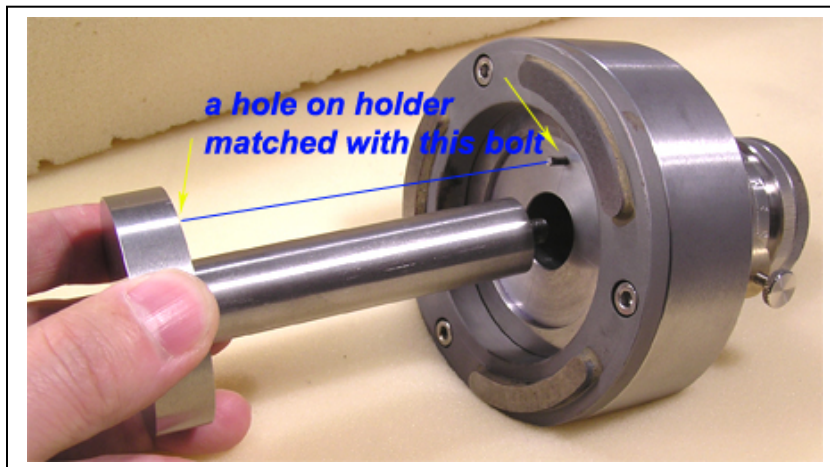


Fig. 14 Connecting sample holder with central rod and inserting the rod into housing



Fig. 15 making the housing standing up



Fig. 16 screwing up the Rod locking nut

- After inserting the central rod into the housing, please carefully make the housing standing up on a flat surface (Flat glass recommended) , and
- Then tighten the Rod locking nut (see Fig 16)



Fig. 17 putting the second force weight back



Fig. 18 putting the first force weight back

- In order to achieve max pressure during lapping, put the second force weight (part b) back to the rod locking nut (part h), see Fig. 17, and the first force weight (part a) back on the second force weight (part b), in Fig.18. For some soft material. You only need one dead weight or no any dead weight.
- Install two micrometers dial into the micrometer mounts and tight the fix screw in Figure 19 (a) and (b).



(a)



(b)

Fig. 19 putting a micrometer into the mount on the fixture

Figure 20 shows the PF-2-1 lapping and polishing fixture held by a York supporter on Unipol 802 polishing machine. During operation the fixture is swept by the York supporter and rotated relatively to master plate for uniform polishing surface.



Fig. 20 the view of PF-2-1 lapping and polishing fixture on Unipol 802 polishing machine

(3) Cautions:

- Before lapping or polishing, you must put the fixture on the flat surface to make sample surface parallel to bottom of housing, then tight locking screw (**Part c**) to make sure central rod can not move up or down in the housing inside.
- Then, preset the thickness to be removed by adjusting micrometer dials screw (**part d**). 0.1 mm – 0.2 mm each setting is recommended.
- Check micrometer dial if moving to sample holder sensitively by lifting the housing fixture. If micrometer did not react, you need reset micrometer to a proper depth.
- Now you can put this polishing fixture on MTI's Unipol801, Unipol802 and any precision 8" polishing machine with York support to achieve automatic polishing or thinning.
- The fixture is excellent for reparation of TEM sample and IC section analysis and flat single crystal substrates. However you need practice more to choose suitable removable setting, lapping speed, and lapping pressure to get the best results.