

Inexpensive Holder for Hand-Trimming Resin-Embedded Tissues

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ABSTRACT A simple and inexpensive mount for securely holding resin-embedded tissues for trimming prior to sectioning for light or electron microscopy is described. The unit is composed of a base plate from which a 12.7-mm drill chuck protrudes. A tissue block is clamped into a microtome chuck and that is mounted in the drill chuck. A standard dissecting microscope is placed over the unit and used to magnify the block for trimming. Total cost of materials is estimated to be \$20–40 USD. *Microsc. Res. Tech.* 56:306–307, 2002. © 2002 Wiley-Liss, Inc.

INTRODUCTION

Trimming of resin-embedded tissue samples is a prerequisite for either thick-sectioning or ultramicrotomy. Although instruments such as the Leica EM TRIM® are commercially available to automate the process, trimming in most EM laboratories is usually done by hand due to the cost of automated units.

Hand trimming requires a solid holder for the block to be trimmed, a stable support for the operator's hands, and a modicum of skill. To this author's knowledge, only one such block holder is commercially available (Butler, 1974), although others have been described in the literature (Boyd, 1960; Danon, 1961). The Butler Block Trimmer is currently offered by most EM supply houses for approximately \$300 USD.

As an alternative to automated trimming or the Butler trimmer, an effective yet quite inexpensive holder for hand trimming of tissue blocks can be constructed by using a large drill chuck mounted upright on a suitable base plate (Fig. 1).

CONSTRUCTION DETAILS

The base plate is made from a 20 × 25 cm piece of 12.5- or 25-mm-thick Plexiglas® or aluminum (Fig. 2). A countersunk hole is drilled through the plate from the bottom to accommodate a central support bolt (~7 cm length, 12.5 mm width, 8 teeth per cm; length of bolt will vary depending on thickness of base plate) to which the drill chuck is threaded. A standard 12.7-mm (i.e., 1/2") drill chuck is used. A short piece of electrical conduit (1.5 cm ID × 3.5 cm length) to act as a spacer and three large flat washers (3.5 cm OD, 1.9 cm ID) complete the assembly. The bolt hole should not be drilled in the center of the base plate. Rather, it should be placed approximately 10 cm from the front edge in order to center the drill chuck under the opening in the stage of the dissecting microscope.

With the exception of the base plate, all of the components should be available at a local hardware store. Window glass companies can supply the Plexiglas® and plate aluminum can be obtained from local metal suppliers.

The tissue block to be trimmed is clamped in a microtome chuck and that chuck is mounted in the drill chuck. The bases of LKB/Reichert-style and RMC hold-

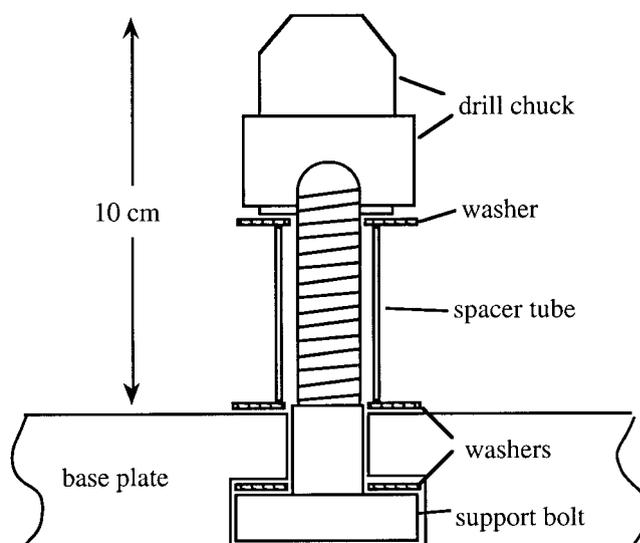


Fig. 1. Diagram of block trimming unit.

ers for round or flat tissue blocks fit in the jaws of the drill chuck. Hand tightening of the chuck is adequate to stabilize the block holder for trimming.

The stage insert and mirror of a binocular, epillumination (i.e., dissecting) microscope are removed and the base of the microscope is placed over the drill chuck (Fig. 3).

The edges of the microscope base provide good hand support and the microscope can be moved to center the block in the field of view. The combined weight of the trimming assembly, the microscope, and the operator's hands makes for a stable and steady resin block for trimming. The microscope light source provides good illumination. Magnifications of 7 to 10× are usually

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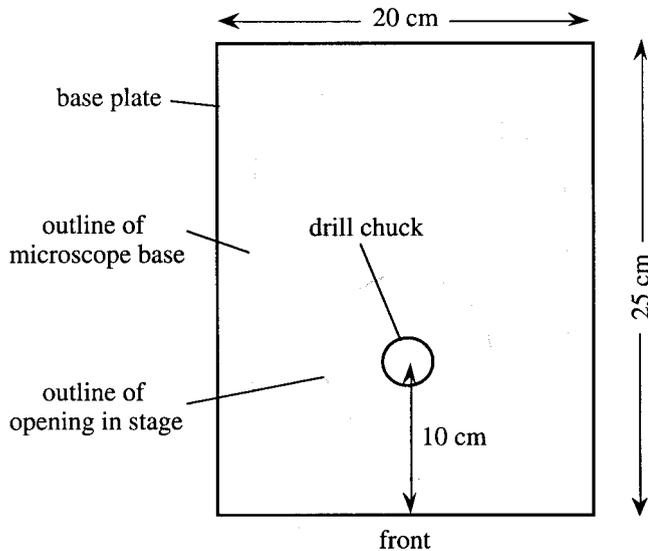


Fig. 2. Diagram of base plate.

sufficient for adequate visualization of the block being trimmed.

Possible aesthetic improvements would include using colored Lucite® or polished aluminum for the base, a keyless drill chuck, and a chromed spacer tube (a section of barrel from a standard toilet paper holder would be an attractive choice). However, none of those modifications would affect the functionality.

Total cost of materials ranges from about \$20 (if used pieces are available) to about \$40 USD. Labor costs may double or triple that amount although the machining and assembly are fairly trivial to undertake in even a modestly-equipped shop. The unit should require no maintenance. A commercial version of the unit will be produced by Ernest F. Fullam, Latham, New York.

SUMMARY

The trimming of resin-embedded tissue samples is an extremely common practice in electron microscopy.

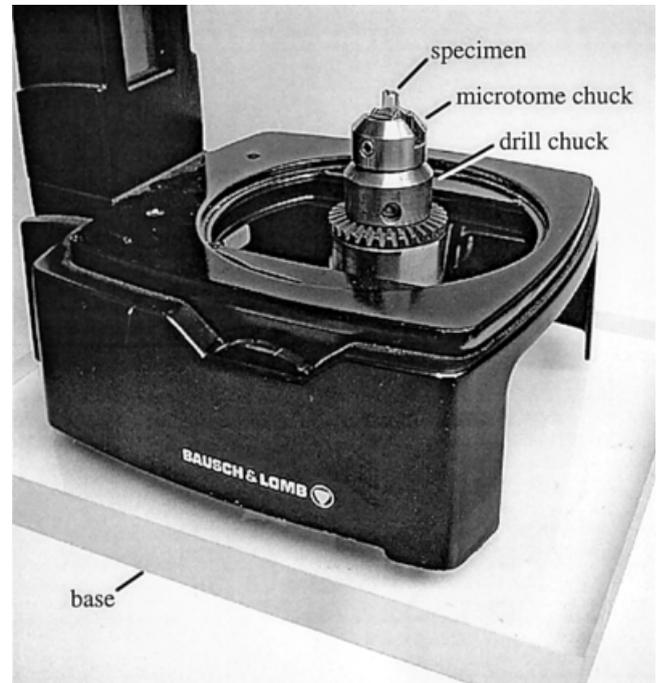


Fig. 3. Photograph of unit set up for trimming.

This communication describes an inexpensive yet functional unit to aid in that procedure. The main advantage of the unit described herein over other available units is maximum functionality for minimum cost.

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