

RESEARCH REPORT

SPECIAL SANDING FILMS AND SANDPAPERS FOR SURFACING

NARROW-RING INCREMENT CORES

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ABSTRACT

Special sanding films (400 grit to 23 micron) and fine sandpapers (1200-1500 grit) can be used to surface increment cores containing narrow rings (e.g., >50 rings per cm) so that rings are clearly visible for microscopy and photography.

INTRODUCTION

Careful surface preparation of increment cores is necessary to make their annual rings distinct for microscopy. As tree-ring research increasingly utilizes slow-growing species having narrow rings (e.g., *Taxodium distichum* (L.) Rich. [Stahle et al. 1988]; *Pinus balfouriana* Grev. and Balf. [Scuderi 1990]; *Larix lyallii* Parl. [Colenutt and Luckman 1991]; *P. aristata* Engelm. [Brunstein and Yamaguchi 1992]), core preparation becomes especially critical. Scratch-free polishing is also vital for producing clear photographs of rings.

Conventional core surfacing methods generally involve sanding with standard sandpaper ranging from 60 to 600 grit (Stokes and Smiley 1968, Swetnam et al. 1985, Phipps 1985, Yamaguchi 1991). Krebs (1972) describes the use of fine steel wool in alternation with sand-

paper on *P. aristata* cores to remove resin that otherwise clogs sandpaper. In our work, we have found that the finest two grades of steel wool (#000 extra fine and #0000 finest) work well to remove resin or, for wide-ring cores, to remove grit left in cell lumens by 400 or 600 grit sandpaper.

Standard sandpaper and steel wool, however, are occasionally inadequate for preparing narrow-ring samples (e.g., those containing more than 50 rings per cm) or samples containing occasional narrow rings, locally present rings (rings that disappear along some tree radii), or coniferous frost rings (rings with cold-induced crushed tracheid cells [LaMarche and Hirschboeck 1984]). We have found several special sanding films and sandpapers useful for preparing such difficult samples.

MATERIALS

The films are "Flex-i-grit" regular and micro-fine sanding films (Table 1). Abrasive particles are mounted on thin, flexible plastic sheets instead of paper. The films are available in a range of grits. They are manufactured with stricter quality control standards, in terms of uniformity of particle size, than conventional sandpaper (Clarence Bartron, Bartron's and Co., personal communication, 1991). Thus, they are less prone to scratch core surfaces than are comparable grades of sandpaper. The sanding films are widely available in hobby shops where they are sold for sanding models. They are also available from the manufacturer, where they are typically purchased for use in dentistry and for polishing computer heads.

The special sandpapers are "micro-fine" wet-or-dry sandpapers (Table 1). These sandpapers are available in large hardware stores.

DISCUSSION

The sanding films and micro-fine sandpapers are commercially available in sheets that are large enough (10 x 13 cm films, 14 x 28 cm sandpapers) for use on electric finishing sanders. Alternatively, one can use both for hand sanding after wrapping them around sanding blocks (e.g., rectangular rubber erasers).

The sanding films and micro-fine sandpapers make possible an exceptional degree of ring clarity in prepared core samples. Our work with *P. aristata* has shown that 400 or 600 grit sanding films produce a surface equal to or slightly better than the 1500-grit sandpaper. In contrast, we found that surfaces prepared with the 1200-grit sandpaper are not entirely scratch-free. They should thus also be sanded with either the 1500-grit sandpaper or with the 400 or 600 grit sanding films.

The finest micro-fine sanding films in Table 1 are probably more than are needed for preparing even extremely narrow-ring increment cores. The 23 micron sanding films are the finest that we have found effective on the *P. aristata* cores we prepare. However, we list all the micro-fine films here, coarse through ultra fine, for completeness.

The new abrasives provide a practical and inexpensive alternative to scanning electron microscopy (Revel 1982) or microtome thin sections (Telewski et al. 1987) for preparing narrow-ring cores. We recommend them because they make working with such cores less exasperating.

Table 1. Sanding films and fine sandpapers for preparing narrow-ring increment cores.

Grit ^a	Name	Abrasive	Color
<i>Regular sanding films^b</i>			
400	Extra fine	Aluminum oxide	Gray-brown
600	Ultra fine	Aluminum oxide	Red
<i>Micro-fine sanding films^b</i>			
44	Coarse	Silicon carbide	Dark gray
23	Medium	Aluminum oxide	Light gray
23	Medium	Silicon carbide	Black
8	Fine	Silicon carbide	Gray
1.5	Extra fine	Cerium oxide	Pink
0.5	Ultra fine	Chromium oxide	Green
<i>Wet-or-dry sandpaper^c</i>			
1200	Micro fine	Silicon carbide	Gray
1500	Micro fine	Silicon carbide	Gray

^a Grit denotes fineness of screen mesh (openings per inch, 1 in. = 25.4 mm) through which abrasive particles pass (Salmon 1992). Micro-fine sanding film numbers are particle sizes in microns.

^b "Flex-i-grit" sanding films are distributed to hobby shops by K and S Engineering Co., Chicago, IL 60638, U.S.A., 312-586-8503. If not locally available, they can be purchased from Bartron's and Co., 1537 St. James Place, Roslyn, PA 19001, U.S.A., 215-659-6184. Any use of trade, product, or firm names is for descriptive purposes only and does not imply endorsement by the U. S. Government.

^c Made by 3M Corp., St. Paul, MN 55144, U.S.A.

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