

Cutting tools for preparation of tree cores in the field for tree ring width analysis

For some purposes, it is useful to get an immediate impression of the tree ring width pattern of cores in the field. To do this, one has to be able to cut the surface of the cores in the field. Here we show some self-developed cutting tools that we have been using successfully:



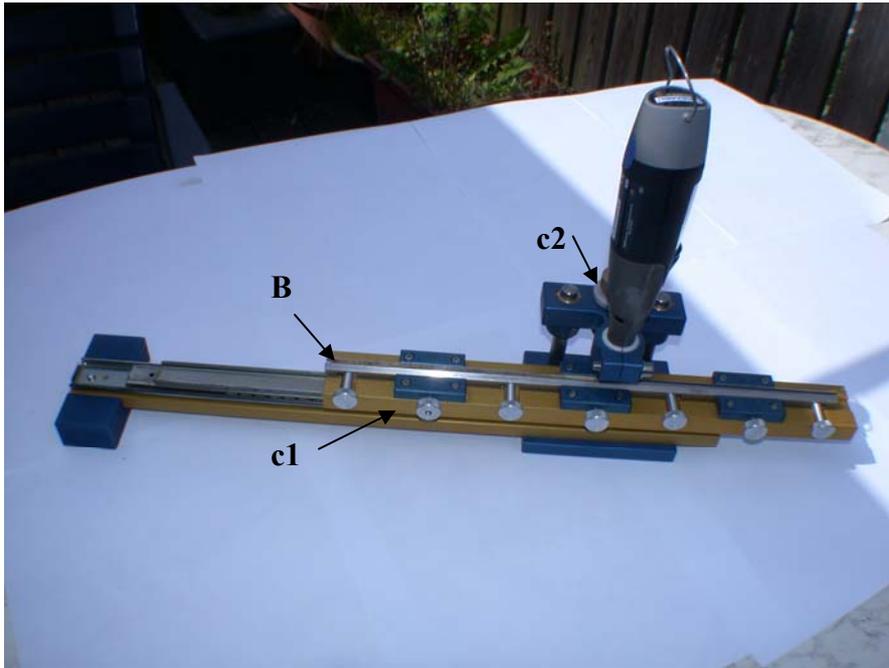
A) One of our first cutting tool made out of metal. It is a U-shaped bar with a moveable bar inside. One puts the freshly taken core with correct orientation of the vessels in the groove, than the core can be fixed by the metal bar in the middle of the U-shaped bar by turning the screws. Than we use a sharp cutter. This one has been in use since the 80ies. It weighs depending on the metal type between 300 to 600 g.



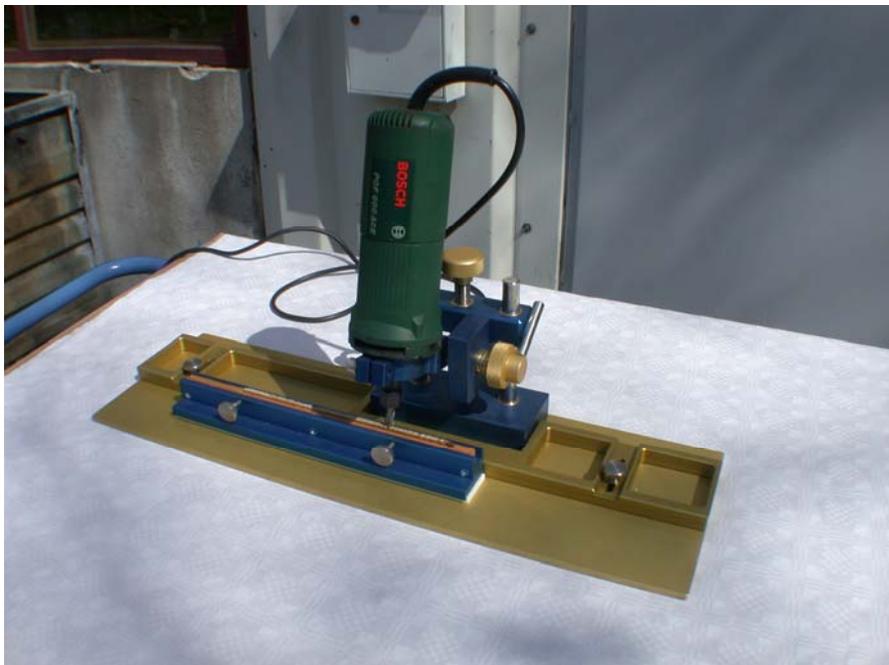
B) This cutting tool is more advanced. It consists of two formed metal pieces (steel tracks or titan), the core can be fixed very tightly turning the screws.



The tool has to be designed according to the size of the section that you want to cut off and the core diameter. This tool gives the best cut. Depending of the size of the section, the type of the wood (hardness) and the precision you want to get, we perform a pre-cut by the following instrument:



- C) This is a cutting tool based on the DREMEL Accu using a special rotating cutter for wood. The core is fixed by the same track (B) as in the previous section. B is fixed on C using a „gliding track“ c1. The rotator can be lowered by screw c2, so that you can define the size of the section that you want to cut off. The core passes the rotator by pushing the gliding track by hand. We cut just so much off, that a small piece of wood (<0,5 mm) is left for the blade cutting (B). This gives the best final result.

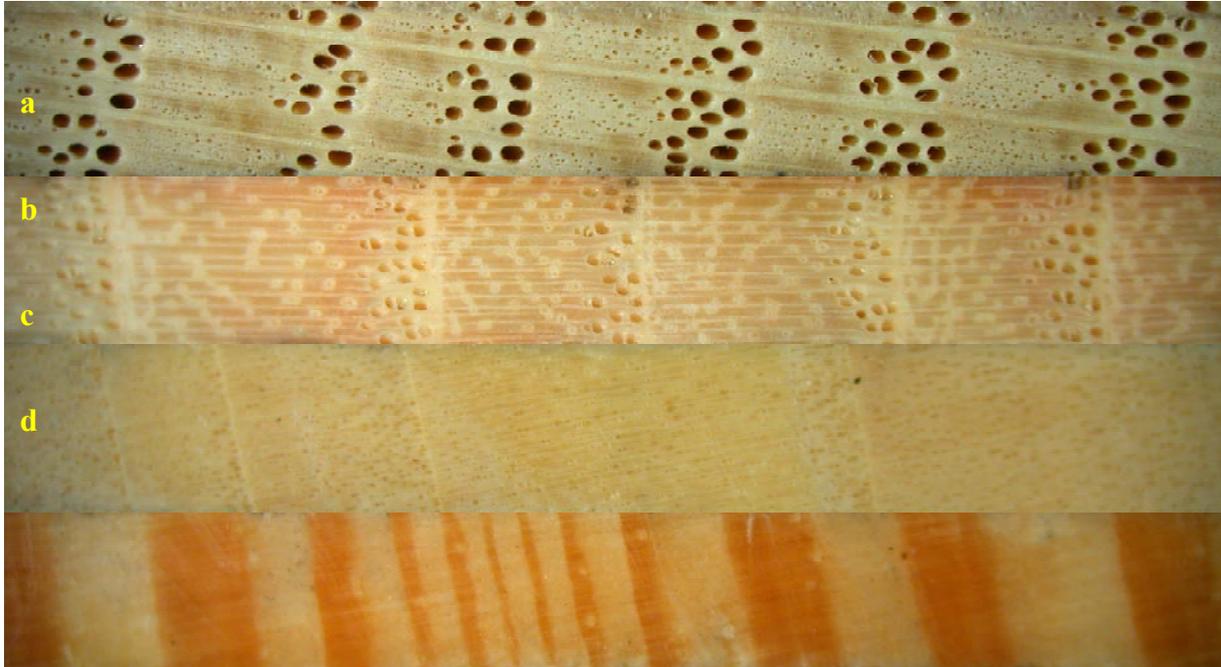


- D) This cutting tool is similar to C, but it is used in the lab with a 230V-electric powered rotator. This instrument is used for correction of already mounted cores that were false trimmed (not rectangular to the vessels). Here the angle of the cutter can be changed and you can use mounted cores on wooden trays as well. Here we usually sand the cores afterwards (coarse 500 und 1000).



Tree ring width – Cutting tools for core trimming in the field

The advantage of cutting in contrary to sanding is, that the vessels keep free and you have a clear impression of anatomical details. One can directly view the samples by binokkular. For REM or EDAX, we immediately deep freeze the cores after cutting in the field. After freeze drying, you can sputter and use the samples directly in the REM or EDAX.



Example images of the surface of the trimmed cores:

- a) Oak (*Quercus robur*);
- b) Ash (*Fraxinus excelsior*);
- c) Poplar (*Populus nigra*);
- d) Pine (*Pinus sylvestris*).