PLASTIC CHANTER REEDS
(Mylar)

Previous versions of these notes were originally compiled with polystyrene food pots intended as the raw material for the blades. When this material became difficult to obtain, I also included instructions modified for the use of an alternative material, Mylar. Since I now use Mylar for virtually all chanter reeds, this edition of the notes is specifically applicable to Mylar. The reeds were developed for the bagpipes which I make. They would not necessarily suit a chanter of different design, though the methods and principles may be useful elsewhere, and the dimensions can be changed as appropriate. The dimensions initially given here are for a chanter in G; dimensions are given at the end for A and low D. Note that I also use the reed of G dimensions (with no modification other than final finishing) in my highland fingering lowland chanter in A.

TOOLS:

Small scissors

Mandrel: made from a piece of 8mm tool steel about 150mm long; turn one end to a taper to fit inside of staple; file tapering 'flats' 20mm long symmetrically on opposing sides of the tip, ending up with a slightly ovalised shape to the tip, the minor axis measuring about 1.3 to 1.5mm. See attached sketch. Alternatively you can buy an oboe reed mandrel from woodwind suppliers, and modify it as above.

Small vice: a swivel vice which clamps to your bench or table is useful but not essential.

Stanley knife: for trimming the ends of the blades; a fresh or keen blade is essential.

Long-nose pliers: preferably with flat, smooth, somewhat flexible jaws with a width of around 6-8mm.

Burnisher: a length of 6mm hardened polished silver steel in a wooden handle. (A screwdriver will do; the smoother and more polished the shank, the better)

Small hard wood block: with very smooth surface; the ideal is end-grain boxwood, 60mm square, 20mm thick.

(**Reed blade shaping tool**: see note below)

Abrasive Paper: 320 and 500 grit, lubricated silicon carbide. See below.

MATERIALS:

Mylar Sheet for the reed blades:

Mylar is the trade name, owned by Dupont, of the plastic resin Polyethylene Terephthalate (PET). It is available in sheet form in precise thicknesses, usually in increments of 50 microns. The thickness of 250 microns (0.25mm) seems to work best for reeds. Its higher stiffness compared with polystyrene accounts for the comparatively lesser thickness. At the time of writing, an A4 sheet (intended for making stencils) is available on Ebay for less than £2, which should yield at least 60 reeds.

For making reeds blades it needs to be curved, which is easily dealt with by heat treatment. The idea is to fix it temporarily to a smooth cylinder, apply heat, then cool it and remove from the cylinder.

I use a smooth aluminium cylinder with a diameter of 80mm.

- Across the width of your A4 sheet (210mm) cut a strip of mylar, the width of which should be slightly longer than the eventual length of the reed blade; 35mm is good for a G reed.
- Wrap it round the former and tape the ends together with masking tape in such a way that the mylar is firm against the former all the way round.
- Immerse the whole thing in boiling water for about 1 minute. Remove and immerse in cold water until cold.
- Remove the masking tape and the plastic should hold its round shape. It may relax by a small amount subsequently. Dry off with absorbent paper towel.

Staples: standard oboe staples, cork removed and reduced in length to 31mm by cutting off the wide end. See notes.

Waxed thread: best diameter is 0.5mm or slightly above. You could use the same yellow hemp as you use for your drone sliders, or get suitable reed making thread from woodwind suppliers. You can wax a length as you go by rubbing with a small block of beeswax, or you can immerse a spool of thread in hot melted beeswax. Once you think it has absorbed as much as it will, take it out, drain and cool. Don't get the wax too hot, especially if the thread or spool is plastic, because they may melt.
I use SES Sterling Lacing Cord Polyamide 1.1 mm x 200m from RS Components, stock no 303-1675 (which comes waxed).

PTFE tape: - white plumbers tape.

METHOD:

1. The staple needs to be prepared by conforming it to the mandrel. For this, it is easier if you first anneal it by heating with a blowtorch until it is not quite at red heat. Lacking a blowtorch, you could use the flame of a gas cooker, holding the staple in a pair of tweezers.
Place the cooled staple on the mandrel. Flatten the end to conform to the flats filed on the mandrel by squeezing between the jaws of long-nose, smooth-jaw pliers. You can form a nice 'eye' with a burnisher (or any smooth steel rod) by firmly stroking towards the tip. The minor dimension of the eye may be important. Somewhere between 1.2 and 1.5mm should be about right.

2. From the 35mm high open cylinder of Mylar prepared above, cut two blades to exactly the same trapezoidal shape, 10mm wide at the lip end and 3.5mm at the other, 35mm long. If you are making a lot of reeds, a shaping guide is useful. See note below. To get consistent results you need to be precise about the shape. There is much room for experiment here. You may find it useful and interesting to experiment with very small changes and note the results, which can take much work to refine.

3. Temporarily secure the blades together (concave surfaces facing) by folding a small square of 19mm masking tape across the lips or you can bind with a few turns of waxed thread.

4. Position the vice on right hand end of the bench (if you are right-handed), or if it is a swivel vice, place it anywhere but angle it at 45 degrees; this is so that your hand does not hit the bench when winding on the thread. Place the mandrel in the vice, with flats above and below.

5. Place a prepared staple onto the mandrel, and slip the blades onto the staple. Using the free end of your reel of thread, secure them with a clove hitch round the tails. Adjust the position of the blades on the staple so that the tails are 13mm from the large end of the staple, and symmetrically opposed above and below. Bind with firm, close turns of thread so that the edge of the last turn comes 34mm from the large end of the staple. Make the last turn a half hitch. Wind back to the start with two or three wide turns, and finish off with two half hitches.
Removing the reed from the mandrel, wind thread onto the bare end of the staple to suit the reed socket in the chanter. Start 1mm from the open end of the staple, trapping the end of the thread with the first few turns; wind tightly and with close turns up to the tails of the blades; back to one-third of the length of the binding with one turn, then close turns for the remaining two thirds back to the tails; then a couple of turns and two half-hitches to finish off. The aim is to produce a tapered bunch of thread which will fit the corresponding taper of the reed socket.

6. Replacing the reed on the mandrel, cover the thread binding the blades onto the staple with a few turns of PTFE tape. This is to make it airtight. Start from the blade end; make a couple of turns there, just covering the end of the binding, then a few diagonal turns towards the tails; make a couple of turns above the socket binding; pull the tape to break it, and rub it down with the fingers.

7. Next reduce the overall length of the reed by cutting the tips of the blades back. Aim for the overall length from the open end of the staple to the tip of the blades to be 45.5mm. Use a new or known to be sharp blade. *After this cut and every subsequent cut of the lips of the blades, before doing anything else, insert the tip of the knife blade between the lips of the reed, squeeze them between finger and thumb of the left hand, while sliding the blade free*. This has the effect of smoothing the inner edges produced by the cut, the edges which need to be smooth in order for the reed to close cleanly when vibrating.

7. At this stage it used to be necessary to induce a little extra curvature in the reed blades by squeezing

across the edges. This does not seem to be necessary in the case of Mylar, provided that the minor dimension of the staple 'eye' is not too small. But it can be a useful move in the case of a reed which sounds 'stuffy', provided it is done very carefully and results in no gross deformation.

8. Sanding to finish.
Use a lubricated silicon carbide paper (such as 3M Trimite Frecut) no coarser than 320 grit.
Proceed as follows:

- support your abrasive paper on a smooth, end grain, wooden block (preferably boxwood) 60 x 60 x 20mm
- cut a small rectangle of paper 80 x 20 mm
- with the finger and thumb of your left hand, trap the ends of the paper on the sides of the block, with the edge of the paper 1mm back from the edge of the block nearest to you
- hold the staple between thumb and third or fourth finger, pressing the blades onto the paper with the tip and first joint of the index finger, the binding touching lightly against the edge of the block
- rub side to side for the full width of the block; count 15 strokes on each side before testing. Be aware of the way in which the pressure of the pad of your index finger is distributed on the blades of the reed. You can vary the pressure to favour the tip, centre or root as necessary.

You will observe that the abrasive paper cuts less as it becomes worn. You may need to change the paper every two or three reeds. When the paper is worn, the blades will need more rubbing than when it is fresh.
Don't move too fast. You want to avoid heating the blades which might relax the degree of curvature.
You may need 20 or more strokes per blade. The response of the reed when nearly finished can often be refined by restricting the removal of material to the area behind the tips of the blades, and by using a finer 500 grit.
You can continue to sand until you reach the response and playing pressure you desire.
Indications that you may have taken sanding too far include:

- you lose some or all of the notes in the second octave
- the playing pitch becomes too low
- the scale loses tuning accuracy, in that the third or sixth become too low
- when playing high G, the chanter will not drop to the low G when you replace the top thumb

If you *have* taken sanding too far, you can usually restore the situation by clipping a small amount from the tip of the reed. Two things to bear in mind when doing this: since the knife blade has a bevelled edge, in order to achieve a truly vertical cut, you need to angle the knife somewhat away from the reed; second, remember to insert the blade between the lips of the reed as indicated above. If you find it hard to successfully make a small cut, in other words to reduce the length of the reed by a very small amount, you are not alone – but practice will help.

When finishing the reed, pay attention to the notes on tuning which accompany these notes on my website.
Keep a thermometer next to your tuner. Note any temperature differences as you go, and change your tuner reference as appropriate, taking temperature differences into account

NOTES

DIMENSIONS FOR CHANTERS IN A.
Make a reed as for a G chanter, but cut the blades (overall length) back, combined with appropriate sanding, until you get a good result.

DIMENSIONS FOR CHANTERS IN D.
1. Staple length, 40mm.
2. Blade Shape: initial length 44, tip width 10.5, tail width 4.
3. Binding on: distance of tails from open end of staple, 15mm.
   binding up to 44mm from open end of staple.
4. Overall finished length, about 57mm.

BLADE SHAPING GUIDE:
Take a pair of long nose pliers. Grind out between the jaws to take a pair of pieces of metal with the same dimensions as the reed blades (but slightly longer at the wide end), and having the same curvature. Braze one piece to each jaw (curves matching rather than opposing), in such a position that when the pliers are closed, a blank is held firmly overall. A sharp blade along the edge of the metal inserts then cuts the blank to shape. A small snap-off blade knife is convenient for this. Keep your Stanley knife just for end-trimming.

STAPLES:
Guercio, Wombacherstr 65, 97816 Lohr-Wombach, Germany. https://guercio.de/produkte/
Email: guercio@t-online.de
This company makes staples for woodwinds of all kinds, including bagpipes.
(Hülse für Dudelsack; 31-36, 40, 48 mm)

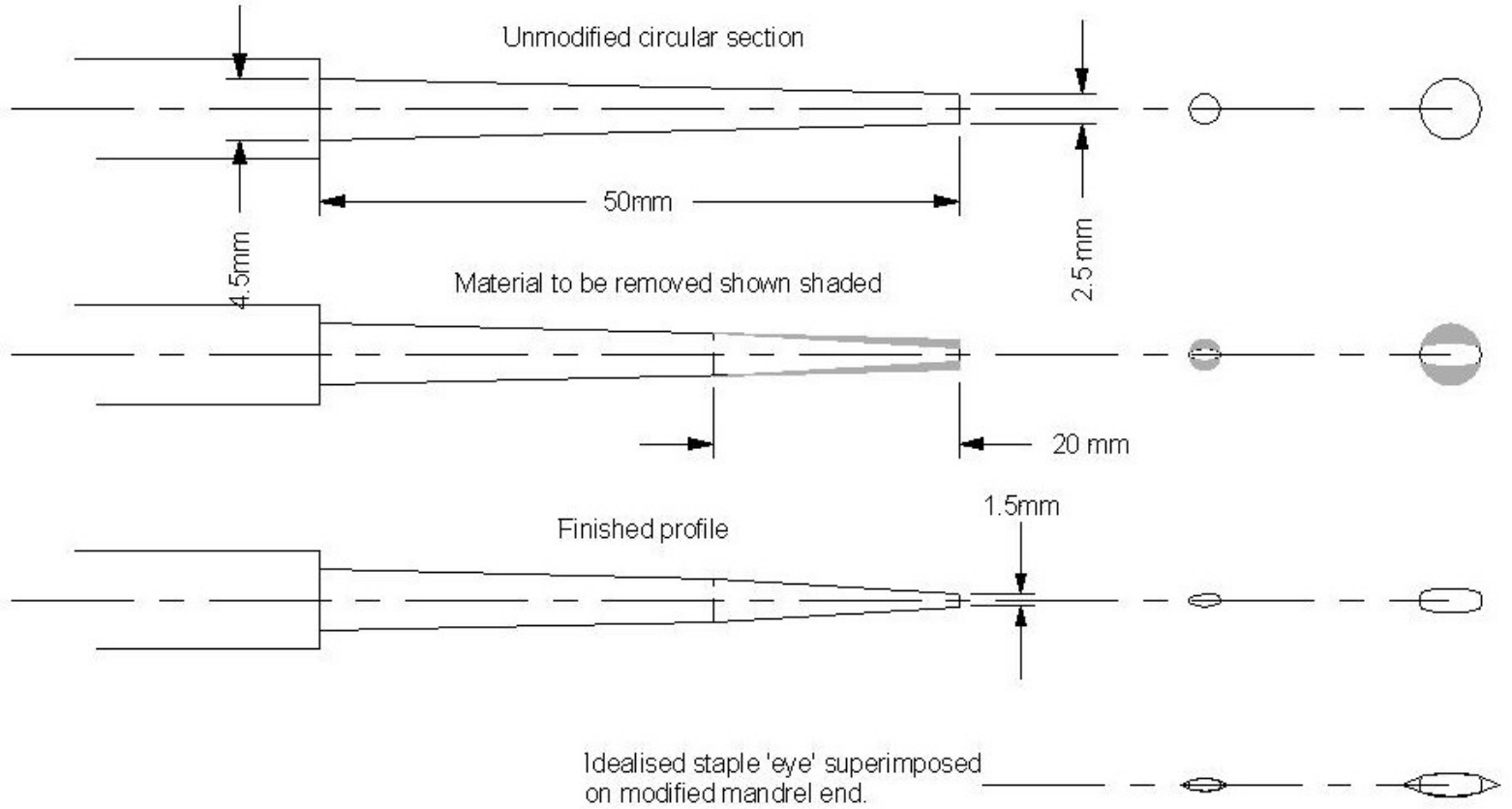
SOME WOODWIND ACCESSORIES AND REPAIR SUPPLIERS

Windcraft Ltd
https://www.dawkes.co.uk/windcraft

Wind Plus Ltd
https://www.windplus.net/

Howarth of London,
https://www.howarth.uk.com/

Mandrel for reed staples.



Scale = 2:1. End views also shown 4:1.