

Purpose-built Chucks. It is often necessary to make special chucks to hold workpieces which would either be damaged or impossible to grip with conventional jawed chucks. Among the methods most commonly used are:-

1. **Glued paper joints;** by which the workpiece may be glued to a wooden pad on a 'reverse-back-plate' type of chuck. The boss of the back-plate is set into the wooden pad, and the whole thing needs to be only marginally thicker than the mandrel nose screw (or the nose screw on an ornamental chuck); this gives minimum overhang, so maximum stability, of the work; having the great advantage that it can hold the workpiece closer to the headstock or ornamental chuck than any other method. Also these glued paper joints can be extremely strong and will tolerate quite heavy cutting. Good quality writing paper gives a really strong joint, whereas newspaper gives a weaker joint but is still suitable for moderate cutting, so this is also the most secure and effective method for all ordinary purposes;

After turning, the piece may be broken free by inserting a knife or chisel into the joint and splitting the paper. The glue may then be peeled and/or soaked off the workpiece; or the piece may be re-chucked in reverse and the glued surface lightly turned to an acceptable finish. Great care must be taken when re-chucking thin-walled pieces as they are flexible so they need to be well supported by one of the following methods.

2. **Flexible glue joints;** by which the workpiece may be fixed at one or both ends to a step or mandrel chuck using hot glue which sets like soft rubber, thus preventing slippage on the mandrel. After turning the piece may be released easily by peeling off the glue.
3. **Pressure fitting;** by which a step, mandrel or sleeve is made to a precise interference fit so as to grip the work sufficiently to prevent slippage but not so tight as to prevent release of the piece after turning. Expanding mandrels may be used if the workpiece is sufficiently sturdy to tolerate the internal pressure without splitting. Where the workpiece has openings at both ends a clamping disc may be used to hold the workpiece securely in compression.
4. **Male or female threads** with accurately turned seats to register the workpiece precisely are ideal for holding the tops and bottoms of screw-threaded box lids and any component of any piece which is to be joined by a screw thread.
5. **Collets** are useful for gripping thin rods (e.g. lace bobbin blanks) which are to be ornamented and then parted off.



Wooden pad glued to workpiece



Back-plate to be inserted and screwed onto wooden pad

6. **Image Mould Supports** may sometimes be necessary to complete irregularly shaped or delicate workpieces which cannot be supported in a conventional manner. One side of the workpiece is completed in the usual way and a reverse of that shape is then cut in a scrap-wood chuck so that the workpiece may be lightly glued face-down onto it. The other side of the workpiece may then be completed and the glue softened by heat or soaked in water to release it from the chuck.
Use only glue that is water soluble or softened by heat, preferably both (e.g. animal glue or hot glue). Wooden workpieces should be glued only on the rim; otherwise removal may require excessive soaking and they may become warped. It is helpful to wax the contacting surface of the chuck except just at the rim.