



Operating instructions for Arrow-Fix

1 Disclaimer of liability

- DiFis - Engineering UG is not liable for any personal injuries or material damages resulting from the use and operation of the Arrow-Fix tool. Parts or the Arrow-Fix tool have sharp cutting edges that can result in injuries if not correctly handled during its use.
- With the opening of the packages and the initial use of the Arrow-Fix, said person will have recognized the disclaimer of liability.
- We recommend strongly for the assurance of a long lasting fixed joint to use Epoxy exclusively in this application.

2 Current Information

- The offer of the Arrow-Fix tool is continuously expanded, further developed and tested, refer to <http://www.arrow-fix.com>.

3 General

- Arrow-Fix is a tool that can be used to work on arrow shafts made out of wood. Basically, the Arrow-Fix's drill bits are manufactured in a cone and optional cylinder form so that two variations of cone points can be inserted into the boring. Arrow-Fix's drill shaft can be fixed into a drill machine and operated with the machine. Arrow-Fix differs to conventional drilling procedures in that the workpiece is fed into the stationary drill and not the drill into the workpiece.
- Selection of a high turning speed by the drill, can result in blackening of the wood shaft. This is from the alloy material from the soft metal of the sleeve. The black color can be removed by lightly sanding with sand paper.
- The creation of the inside cone drilling needs practice and experience. We recommend practicing with a shaft of a single wood type to learn the appropriate speed and pressure to be used.
- By the tightening of the Allen screw, please observe that with the delivered Allen wrench and its leverage, a high torque can be created. The threads in the light metal body can be damaged when too much force is applied.

4 Assembled condition upon delivery

- The ordered body size is mounted.
- The drum is appropriately set to the body size.
- Blades for the pointer are mounted ready for operating.
- Drill bit is ready for operation.

5 Tool adjustments

- Change of the drum settings of the pointing tool to allow for another shaft diameter.
 - Loosen the middle fixed screw with the delivered six sided Allen key.
 - Remove the screw.
 - Turn the drum to the position of the desired diameter over the opening of the indicated pointer.
 - Screw in the screw with the Allen key and leave it loose.
 - In order to set up the drum on the base body, set a arrow shaft in the prism so that the drum cannot turn and is secure.
 - While securing the drum with the arrow shaft, screw in the screw with the Allen key.
 - Check that that the prism of the drum and the prism of the base body are aligned.
- Installing and removing the sleeve.
 - Before changing the sleeve remove the drill bit to prevent any tension of the parts by the installation.
 - Loosen the set screw of the base body with the Allen key and pull the drill bit out of the housing. Pay attention to the sharp edges of the drill and that it will not roll away when laid

- down.
- Loosen the fixed screw of the sleeve with the Allen key and pull out the sleeve.
- When installing the sleeve pay attention that the surface of contact is clean.
- Install the setting screw of the sleeve and with good hand strength set the screw with the Allen key so that there will be no damage to cylinder of the base body.
- Carefully insert the drill bit until it comes in contact with the sleeve.
- The drill bit is so positioned, that the clamp surface of the drill shaft is at a right angle too the clamp screw.
- Insert the clamp screw and and with moderate strength screw it in such that damage to the threading of the base body is prevented.
- The Drill Installation and Removal
 - Loosen the set screw of the base body with the Allen key and pull the drill bit out of the housing. Pay attention to the sharp edges of the drill and that it will not roll away when laid down.
 - Insert the drill bit carefully until it comes in contact with the sleeve.
 - Inserting the drill bit prior to mounting the sleeve can cause the following problems:
 - The sleeve can be damaged if it is mounted after the drill bit.
 - The drill bit can also be damage from the mounting of the sleeve.
 - The sleeve with the drill bit could be distorted from the mounting.
 - The sleeve may not be able to placed in its correct position.
 - The drill bit is so positioned, that the clamp surface of the drill shaft is at a right angle to the clamp screw.
 - Insert the clamp screw and and with moderate strength screw it in such that damage to the threading of the base body is prevented.
- Change of Tools: Remove the Cone drill and insert the drill tool for the T-Tip.
 - The tool for creating the boring of the T-Tip would be installed instead of the cone drill.
 - Loosen the set screw of the base body with the Allen key and pull the drill bit out of the housing. Pay attention to the sharp edges of the drill and that it will not roll away when laid down.
 - Insert the drill tool for the T-Tip and position it such that the clamp surface on the tool shaft is at a right angle to the clamping screw.
 - Insert the clamp screw and and with moderate strength screw it in such that damage to the threading of the base body is prevented.
- Installing and removing the blades.
 - The pointing blades for the nock and point are between each other compatible and exchangeable.
 - The blades are fixed each with a Allen screw.
 - By the installation of an additional blade, pay attention that the inside face of the blade is clean, the phase points up and the blunt long side of the blade is installed against the base body's edge.
 - Insert the clamp screw and and with moderate strength screw it in such that damage to the threading of the base body is prevented

6 Manufacture of the Inside Cone

- Preparation
 - Basically, it is as much a hand operation as a machine operation to manufacture the inside cone with the Arrow-Fix. In practice, it is preferable to do the machine operation since it is easier and quicker to achieve your goal.
 - Cut off the damaged area of the wood shaft, so that no fraying and splinters can be seen. The abutting face that the drill bit comes into contact with should run perpendicular to the long axis and should show the drills fluted cutting section.
- Hand operation
 - Principally, the hand operation is to proceed like sharpening a pencil.
Lead the wood shaft in to the mounted sleeve and set it into the opening with a turning and feeding movement. The pressure and time is more or less dependent upon the diameter and wood type.
The removed ships are removed along the drill windings out of the boring and finally discharged through the sleeve's situated window of the tool.



The chip removal can be supported through blowing and a simultaneous back and forth movement of the wood shaft.

The drilling process is finished when the remaining wall between the inside cone and the outside diameter is minimized, for example the wood shaft has been fully inserted and no more additional chips can be seen.

- Machine operation
 - It is a practical solution, to have the drill machines chuck set into the holder with a continuous variable speed. By drilling with Arrow-Fix, the wood shaft is fed into the stationary drill and not the drill into the workpiece.
 - Secure the drill machine holder to a table top, so that the long axis of the drill machine runs parallel to the table top.
 - With the appropriate mounted drill and sleeve, the Arrow-Fix and its drill shaft should be braced into the drill's chuck.
 - Turn on the drill machine with a moderate speed and set it to continuous operation.
 - Hold onto the wood shaft with both hands and slowly lead it into the sleeve parallel to the drilling axes.
 - By the contact with the drill begins the drilling process.
 - The necessary feed motion of the wood shaft into drill is dependent of the wood type of the shaft. The selection of drilling speed is dependent on the wood's properties.
 - The discharge of wood chips can be facilitated through the the continuous in and out movement of the wood shaft.
 - As you near the end of the sleeve with the shaft, you should be careful that none of the wall of the shaft is damaged. For example, the shaft could get caught and if so, it would tear out.
 - A tear out of the wall of the shaft does not make it absolutely unusable, typically you can use the epoxy to fill in the tear out.

7 Manufacturing the Outside Cone for the Point and Nock

- In the base body has 2 point sharpeners incorporated. The appropriate uses are indicated by the embossed symbols on the tool.
- The angle size is different between the two point sharpeners. The sharpener for the point has an angled sharpener to create a longer pointed cone then the nock point sharpener.
- The desired diameter can be selected through the setting and adjusting of the barrel.(see Change of the drum settings of the pointing tool)
- Lead the wood shaft into the drum of the desired sharpener. (point or nock)
- With a hand, sharpen the wood shaft by turning it in a right direction with a light pressure.
- Depending on the wood type, you may need to use more or less hand strength.(Hard wood requires more strength)
- The hand strength can be supported with a rubber arrow puller or appropriately prepared pliers with soft coating to help take it.
- The cross section is also dependent on the wood type and can have different characteristics. Ceder has a relatively even surface. Spruce can tend to have a stripped surface but for the joining, it is not a disadvantage.
- The cutting process is complete when the point of the shaft has been achieved and and no more chips are created.

8 Joining of the Inner and Outer Cones

- Once the inside and outside cone of the wood shafts have been created, the shafts exact fitting can be determined. The exact fitting is dependent on the differences in the outside diameters that exists between the two shafts to be joined. A difference of a tenth of a millimeter, that lays with in the finished tolerance, can be considered an exact fit.
- The outside and inside cone is set together with a light turning movement. The cone surface of the outside cone should completely set into the inside cone.
- If applicable the inside cone needs to be reworked with the cone drill again or the outside diameter of the opposite piece should be adjusted.
- The joined parts then should be set into the prism of the tool and fixed with the o-rings. It is important to pay attention that the glue joint is placed in the middle of the prism and the epoxy



on the whole piece does not touch the side of the prism.

- The curing time of the epoxy is dependent on the surrounding temperature and the type of epoxy. For working with the epoxy, you should basically pay attention to the manufactures instructions.

9 Work after the Jointing

- After the curing process you can take the wood out of the prism. If applicable judge if the shaft has been successfully manufactured.
- Hardened and excessive epoxy can be removed with sandpaper.
- The gaps between both pieces can be made smooth, as accordingly with a mixture of sawdust and epoxy, it can be cosmetically improved.

10 Manufacturing of the Boring for the T-Tip

- Secure the drill machine holder to a table top, so that the long axis of the drill machine runs parallel to the table top.
- Install the the T-Tip drill tip with the appropriate shaft diameter before mounting. With the appropriate mounted drill and sleeve, the Arrow-Fix and its drill shaft should be braced into the drill's chuck.
- Turn on the drill machine with a moderate speed and set it to continuous operation.
- Hold the wood shaft in both hands and feed it slowly into the sleeve parallel to the drills axis.
- The cutting operation begins with contact with the drill bit.
- The required feed motion of the wood shaft into drill is dependent of the wood type of the shaft. The selection of drilling speed to choose is dependent on the wood's properties.
- The discharge of wood chips can be facilitated through the the continuous in and out movement of the wood shaft.
- Continue to feed the shaft until the desired depth is reached.

11 Joining the T-Tip and the Arrow Shaft

- Prepare and mix epoxy(50:50) and insert it into the boring of the arrow shaft or apply it to the T-Tips insert so that both pieces can be joined. The T-Tip insert should be inserted into the boring and slowly turned so that the air from the epoxy is removed correctly. The T-Tip should be held in place until the it sets up. With a towel or paper towel remove the epoxy that has extruded from the boring. After it has set up, you should confirm that the epoxy in the grooves of the T-Tip with the wood have securely bound.