

## **Using the ANVIL Main Tube Mitering System (MTMS)**

### **Installing the rotary table on a vertical or horizontal mill**

Read the operating instructions enclosed with the rotary table thoroughly.

1. After unpacking the rotary table out of the box, it will need a thorough cleaning. It is shipped with a protective coating which can be easily removed with denatured alcohol or any industrial or automotive degreasing product. Use common sense here and don't use anything that will remove paint or worse.
2. Attach the rotary table to the mill's table, preferably with the handwheel facing you. Included in the shipping box for the rotary table are all the clamps necessary to attach it to the mill. Use t-nuts appropriately sized for your table.
3. Roughly square rotary table to the mill table, then lightly snug all three clamps.
4. On a vertical mill, tram the rotary table face to the mill to ensure a near 0-runout. Trimming the miter fixture to your mill requires a dial or test indicator, which is not included with the miter fixture. Insert the indicator in/on the spindle of your machine.
5. Insert two t-nuts included with the MTMS rotary table adapter into the slot on the rotary table, one on either side of the center pivot and install the rotary table adapter plate. If you are using a vertical mill, set the keyway parallel to the rotary table's vertical base. With a horizontal mill, set the keyway parallel to the long axis of the rotary table or the mill table.
6. After the rotary table adapter plate is installed, make sure the stainless steel key on the plate is perpendicular to the mill's spindle. Center the coarse degree adjustable index mark on the side of the rotary table to zero on 90 degrees or 360 degrees depending on your preference for reading your angles.
7. Zero the rotary table's vernier.
8. Move the rotary table to the rough center of the dial indicator, taking care not to hit the body of the indicator. The ball of the dial indicator's probe should rest lightly on one side of the stainless steel key of the adapter plate. Zero will be established off this key.
9. Zero the indicator and then, from the center of the key, traverse across the rotary table adapter's key face to one side of the table and adjust the table until the dial indicator reads near zero. Since you are trimming to one side from center, you only correct table rotation by half the amount of the runout indicated on the test indicator. Travel back along the key to center and see if it remains at zero. If it does, you're golden. If not, rinse, lather, and repeat until it does. After achieving a zero reading, set the

rotary table's coarse degree indicator to zero then lock the rotary table spindle and reset the handwheel vernier knurl to zero.

10. Rotate the rotary table using the handwheel, take the backlash out of the rotary table by always turning clockwise to come up on your zero, and then recheck your tram. If your zero repeats you're good as gold. If not, re-tram to the spindle. Take your time and do this properly: every miter you make will depend on the system being accurately trammed to the mill spindle.

### **Assembling the Main Tube Miter System (MTMS) and preparing for use.**

NOTE: If you are installed the MTMS on a vertical mill it is very important that the mill's head is properly trammed before the MTMS is installed.

1. If necessary, attach the miter fixture tail to the baseplate with included flathead machine screws (the tail may be already installed by ABW or removed for shipping depending on shipping method and location).
2. Install the MTMS to the rotary table. The base of the MTMS fits over the rotary table adapter's stainless key and attaches with the three supplied socket head cap screws.
3. Ensure your rotary table is at your trammed zero position
4. Install a known straight, thick wall tube, such as a steerer tube, into the jaws of the MTMS. Tram the mill spindle to the back of the tube, making sure the cam action clamp is snugly closed. It should read near zero. If it requires adjustment, adjust the rotary table until the dial indicator reads zero when tramping along the tube's length. Remember to always remove the table's backlash by ending your table adjustments with a clockwise turn of the handle.
5. Once zero is achieved, lock the table in position, and reset the rotary table handwheel vernier to zero.
6. Install the tube phase adapter to the tailstock.

To center the mill spindle to the centerline of the tube blocks insert a rod or tube of known diameter into the MTMS and clamp. Use an edge finder to locate the outer edge of the tube, then move over the radius of the rod to center. Zero your DRO or your mill's handwheels here.