# PPL Average Deflection Force Testing Procedure

January 16, 2025

## Purpose

The Average Deflection Force (ADF) test is a method by which stiffness of a paddle face and its core can be determined. ADF values are utilized during the paddle certification process to determine the side of a paddle to be tested for spin and paddle-ball coefficient of restitution (PBCOR). The ADF test is also used on-site at professional-level tournament venues as an indirect performance metric to ensure all paddles are under the specified performance ceiling.

## Preparation

1. For testing in a laboratory setting:
    a. Condition Paddle
        i. Paddles must be stored in a conditioned environment for a minimum of 4 hours prior to start of any testing or measurements taken
            1. Temperature requirement: $72^o \pm 2^o\ F$
            2. Relative humidity requirement: $50\% \pm 10\%$
2. For testing in a tournament environment:
    a. Check paddle surface temperature using temperature gun
        1. Paddle surface temperature requirement: $72^o \pm 3^o\ F$
3. Set up Automated Design Corporation's (ADC) Pickle Press Load Frame (PPLF)

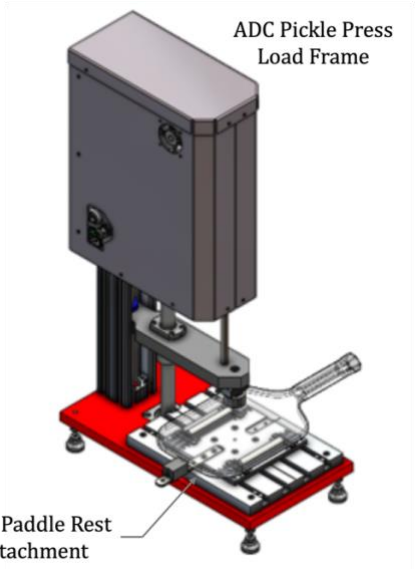


**Figure 1 –** *ADC PPLF with Paddle Rest attachment*

    a. Turn on the system according to manufacturer's manual
    b. Run 2" position calibration according to manufacturer's manual
    c. Ensure ADC Paddle Rest is centered under Compression Toolhead and has the proper Support Rods and locations

i. The supports shall consist of two 4” long cylindrical steel rods of a 0.50” diameter set in v-groove channels 6” apart from centerline to centerline (refer to Figure 2)

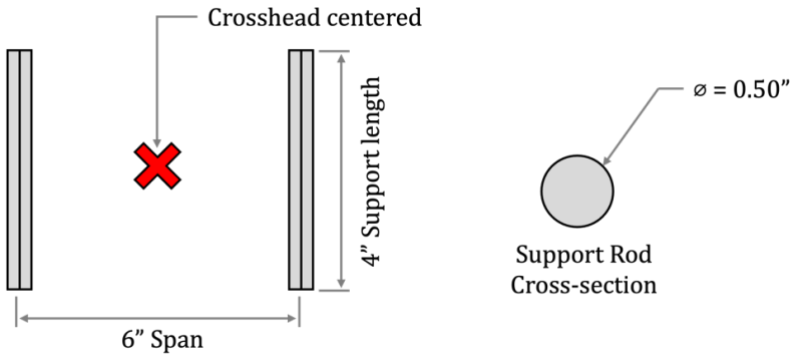


**Figure 2 –** *Placement of Support Rods on ADC Paddle Rest attachment*

d. Test settings are as follows:
   i. Preload of 5 lb
   ii. Crosshead speed of 0.05 in/s for all load-inducing movements
   iii. Deflection Depth of 0.0625 in after preload application
e. See Appendix A for Compression Toolhead specifications

**Test Procedure**

1. Align the paddle in the X and Z direction so that the zero position is at the tip end of the paddle on the centerline (see Figure 3)
   a. Deflection test can be conducted at any location on the face of the paddle
   b. Standard test is conducted at the 4 and 5 inch locations along the centerline for both sides (face A and face B) of the paddle (4 total tests per paddle)

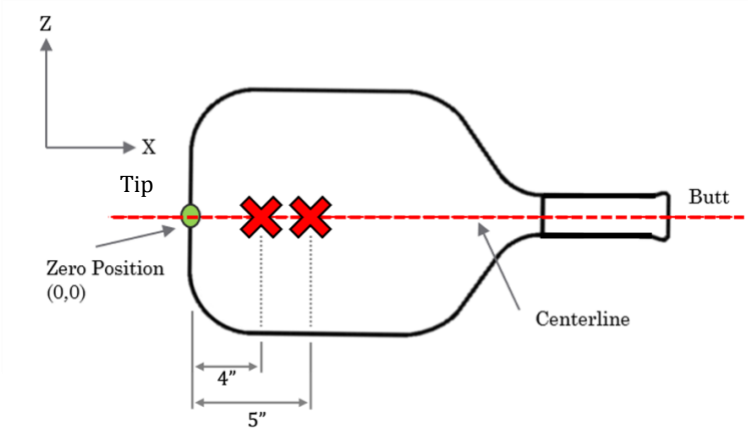


**Figure 3 –** *Paddle alignment and testing locations*

2. Position the paddle on the Support Rods so that the Compression Toolhead is directly above the appropriate paddle test location

3. Test sequence, automated using code within PPLF software, is as follows:
    a. Apply 5 lb preload
    b. Zero the load measurement
    c. Compress to 0.0625” depth beyond the preload position
    d. Record force at 0.0625” depth
    e. Return Compression Toolhead to its home position
4. Repeat steps 2 and 3 until all compression force measurements have been taken
5. Calculate the Average Deflection Force (ADF) for each face of the paddle by taking the average of the force readings on each face
    a. For clarity, for standard tests, there will be 2 ADF values, one for face A and one for face B

## Appendix A

## Compression Toolhead Specifications