



**Purpose:** To determine if a synthetic bowling pin has less than a 5 gram differential in balance about the vertical axis (the axis of the bowling pin that goes through the bowling pin vertically when it is standing on its base) of the bowling pin.

**Materials:**

- Synthetic Bowling Pin to be tested
- 5-gram mass
- Permanent marker
- Water
- Watertight vessel large enough to submerge a bowling pin laying on its side
- Wide rubber band

**Procedure:**

1. Fill the watertight vessel with enough water so a bowling pin can freely float on its side in the vessel without touching the bottom or sides.
2. Place the synthetic bowling pin in the water-filled vessel so it is floating on its side.
3. Allow the synthetic bowling pin to rotate in the water about its vertical axis until it settles.
4. Make a small mark on the side of the synthetic bowling pin that is sticking out of the water. The mark must be made at the ball contact point, centered on the side of the synthetic bowling pin.
5. Remove the synthetic bowling pin from the water and place the rubber band around the ball contact line of the synthetic bowling pin.
6. Place the 5-gram mass under the rubber band where the mark was made in step 4.
7. Return the synthetic bowling pin to the water in the sink and let the synthetic bowling pin float on its side.
8. Allow the synthetic bowling pin to rotate in the water about its vertical axis until it settles.



9. If the synthetic bowling pin settles with the mass that was placed under the rubber band on the underside of the synthetic bowling pin, the synthetic bowling pin passes the vertical balance test.
10. Record pass or fail.

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