# Flow Visualization Lab

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**Figure 1a.** Streaklines around a circular cylinder at a Reynolds number based on cylinder diameter of =957.96. The streaklines are marked by neutrally-buoyant dye injected from a small hole at the front of the cylinder. Flow is from left to right.

A diagram of a conditioner

Description automatically generated with medium confidence

**Figure 1b.** Streaklines around a circular cylinder at a Reynolds number based on cylinder diameter of =1916.52. The streaklines are marked by neutrally-buoyant dye injected from a small hole at the front of the cylinder. Flow is from left to right. A sequence of four snapshots are shown with a time of 200 ms between each snapshot.

A close-up of a pen

Description automatically generatedA close-up of a light bulb

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**Figure 1d.** Streaklines in the boundary layer developing along a flat plate: (left) laminar case, (right) turbulent case. The streaklines are marked by neutrally-buoyant dye injected from a series of small holes along the plate. Flow is from left to right.

[copy and paste your figure 1d here]

**Figure 1c.** Streaklines in the boundary layer developing along a flat plate. The streaklines are marked by neutrally-buoyant dye injected from a series of small holes along the plate. Flow is from left to right. The arrow indicates the approximate location of transition from laminar to turbulent flow. At this location, the Reynolds number based on distance from the leading edge of the plate is =XXXX.

[copy and paste your figure 1e here]

**Figure 1e.** Streaklines around an airfoil at an angle of attack of 8o and Reynolds number based on chord length of =9847.5. The streaklines are marked by neutrally-buoyant dye injected from a small holes along the surface of the airfoil. Flow is from left to right.

[copy and paste your figure 1f here]

**Figure 1f.** Streaklines around an airfoil at a Reynolds number based on chord length of =XXXX, and three different angles of attack: (left) 0o , (middle) Xo, (right) Xo. The streaklines are marked by neutrally-buoyant dye injected from a small holes along the surface of the airfoil. Flow is from left to right in each image.

A golf ball with a fishing hook

Description automatically generated

**Figure 1g.** Streaklines in the flow over a Golf Ball. The streaklines are marked by neutrally-buoyant dye injected from the stagnation point in the front. Flow is from left to right. The Reynolds number based on the diameter is =8370.38.

Short-Answer Questions

**2a.** *Write one paragraph (using appropriate fluids terminology) that describes the differ- ences in flow phenomena observed between the low and high Reynolds number cases for the cylinder.*

[insert your response here]

**2b.** *Write one paragraph that discusses the limitations of the dye-injection technique you used in the lab. Suggest an alternative flow visualization technique that might provide better (or additional) information about the flow fields you examined. You will need to perform some research (using the internet or textbook) to answer this question. Include a citation for the reference used.*

[insert your response here]