Project Title: Swivel Redesign to Increase Flow

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Area: Mechanical Engineering

Sponsor: Reelcraft Industries, Inc.

Reelcraft Industries, Inc. manufactures a wide range of hose, cord, and cable reels used in a wide variety of industries and applications. Reel models include spring retractable, motor-driven, and hand crank. The reels are used to transfer fluids, such as air, water, transmission fluid, grease, oils, antifreeze, diesel fuels, pesticides, fertilizers, solvents, and chemicals, and to coil welding cables, extension cords, and power cords.

Reelcraft is seeking a CFD analysis of their 0.5-inch swivel. The swivel is part of the reel assembly—it allows the reel to rotate while spooling the hose, cord, or cable in and out. The main objective of this project is to reduce the pressure loss from the swivel to provide a 10% increase in flow rate. The new design of the swivel must have an outlet whose axis is in line with the center of the hose pass-through. This alignment will be achieved by a GD&T position tolerance of +/- 0.0625 inches. The design must conform to the standards of the Rubber Manufacturers Association. The prototyping and testing budget for this project is $10000.