

Swim Resistance Equipment

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Client: University of Wyoming Swimming & Diving

Project Description / Approach

The Swim Resistance Equipment Group is developing an improved resistance training system for University of Wyoming Swimming & Diving. This new system will replace the current one to enhance training capabilities and overall performance. It utilizes magnetic braking to generate resistance for swimmers. A rope unwinds from a shaft, spinning a flywheel via a belt drive. The magnet system then applies resistance to the flywheel, creating a resistive force felt by the swimmer.

Design Requirements

- Ability to measure resistance and power output
- Ability to dynamically adjust resistance (0-50 lbs.)
- Corrosion and water resistant
- Transport wheels
- Easy to move
- Maximum extension (25 m)
- Small footprint ($\leq 693 \text{ in}^2$)
- Easy to set up and take down
- Equipment to athlete connection

Belt Drive
(Geared to increase magnetic braking effects)

Magnet Holder
(Holds 20 neodymium magnets)

Aluminum Flywheel
(Helps to create magnetic braking effect)

3D-Printed Rope Spool
(Holds 25 m of waterproof rope)

Constant Torque Retraction Device
(Automatically rewinds rope and swimmer after each effort)

T-Slot Extruded Aluminum Frame
(Allows for easy adjustments and modifications)

