**Impeller**

**PRODUCT:** Impeller Assembly (5” Diameter)

**MATERIAL:** 30% Glass filled PPO

**METHOD:** Ultrasonic welding

**REQUIREMENTS:**
- Weld the Shroud (red) to the Impeller Body (gray) to create a strong structural bond.
- Minimal flash and marking is acceptable.

**TECHNIQUE:** Place Impeller Body in a fixture, and contact the Shroud with a contoured horn.

**JOINT DESIGN:**
- Energy Director on top of vanes (yellow), 0.015” tall, 60° included angle
- Branson 450 / MoldTech 11050 texture on Shroud, opposing Energy Director.
- Grooves on the opposing surface to help contain flash
- 3 Alignment Pins, 0.125” diameter.

**DESIGN CHOICES:**
- Parts are too large to weld in 20 kHz. High amplitude output of 15 kHz allows welding of PPO material with unity gain horn.

**EQUIPMENT:**
- **Welder:** Branson 2000X 15 kHz AED welder with 3.3 kW power supply, 3” cylinder.
- **Horn:** 15 kHz circular hollow horn, 5.33” OD 2.0”ID, carbide coated for wear resistance.
- **Booster:** Black (1:2.5 gain)
- **Fixture:** contoured stainless steel anvil, mounted to a standard aluminum base plate.

**PARAMETERS:**
- **Weld Time:** 1.25 seconds
- **Hold Time:** 2.0 seconds
- **Downspeed:** 1.0 in/sec
- **Pressure:** 60 psi
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