Axial Impellers

Marine-Type Propellers

- Variable Angle of Attack
- $N_p$: 0.3 - 0.9
- $N_q$: 0.6 - 0.7
- Shear Flow: Med
- Viscosity: Med - Low - Med
- Mixing Intensity: Med - High

Viscosity: 0 – 5,000 cps

Pitch Blade Turbines

- Constant Angle of Attack
- $N_p$: 0.9 - 1.6
- $N_q$: 0.7 - 0.9
- Shear Flow: Med
- Viscosity: Med
- Mixing Intensity: High

Viscosity: 0 – 50,000 cps

Low / Mid Solidity Hydrofoils

- Variable Angle of Attack
- $N_p$: 0.3 - 0.6
- $N_q$: 0.6 - 0.7
- Shear Flow: Low - High
- Viscosity: Low - High - Low - Med
- Mixing Intensity: High - Off-Bottom

Viscosity: 0 – 3,000 cps

Radial Impellers

Things to Consider

- Avoiding unwanted flow patterns with impeller design
  - Dead zones, short-circuited flow, vortexing
    - Location of outlet stream
- Viscosity of fluid
- Volume of fluid being mixed
- Diameter of blades relative to tank volume
- Number of blades
- Justify your impeller design based on the system!
http://www.dynamixinc.com/

- On this website (http://www.dynamixinc.com)
  - Typical uses of each impeller type
  - Important factors for ideal mixing
  - Baffles configurations
- Search google for more design considerations/examples