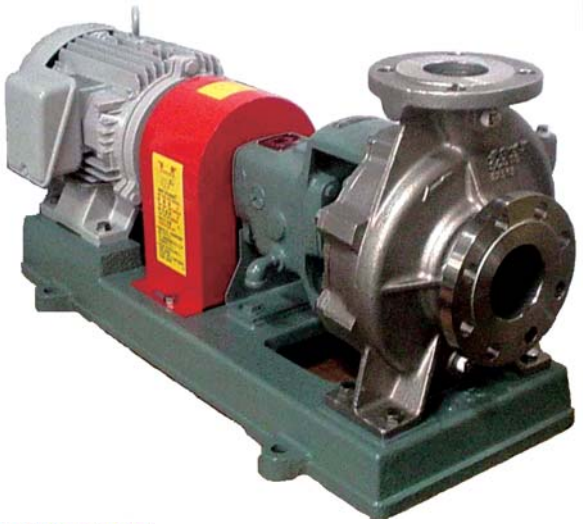
Analysis of Centrifugal Pumps

Case Study for MALHATY PUMP MFG. CO., LTD.

Application of SC/Tetra to Simulate and Validate the Performance of a Centrifugal Pump



MALHATY PUMP
MALHATY PUMP MFG. CO., LTD.

Pictured: FIC type pump

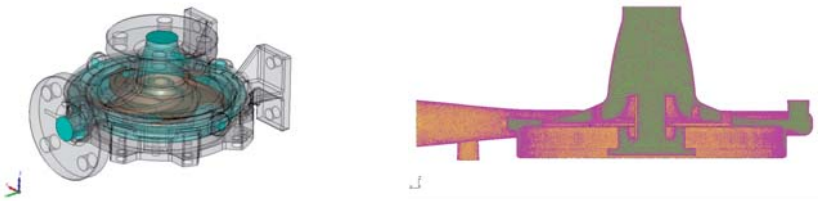
Uses of Centrifugal Pumps

- General plant use
- Effluent treatment plants
- Environmental pollution control systems
- Water supply and sewage treatment systems
- Solvent transfer and handling of unique fluids

Characteristics

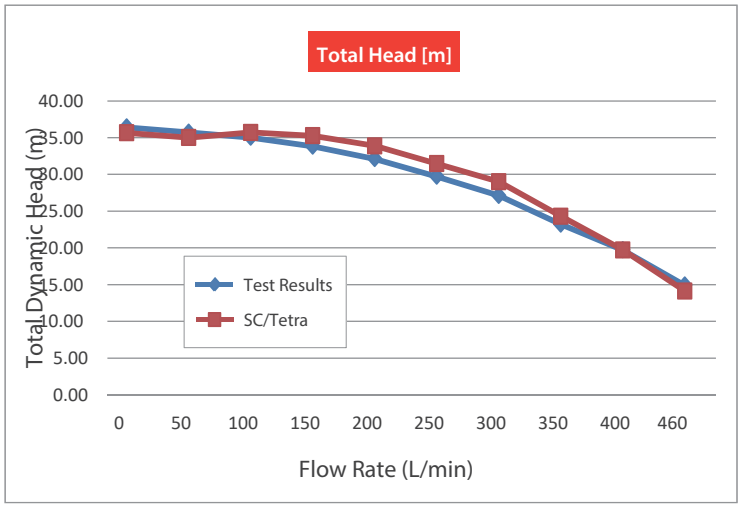
- Because the pump is integrated with the base, back pullout construction is employed to enable dismantling of the main rotor including the impeller, making it easier to inspect the parts without having to remove the pipes
- Main rotor and impeller can be inspected without removing pipes because the pump is integrated with the base back pullout section
- Meets Japan Society of Industrial Machinery Manufacturers Standards (JIMS) for 16-bar-class products

Analysis model



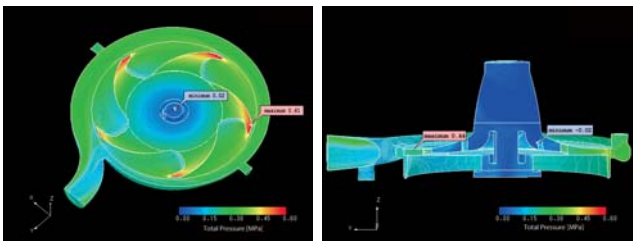
Number of mesh elements: 2,534,983

Comparison between analysis and test results*

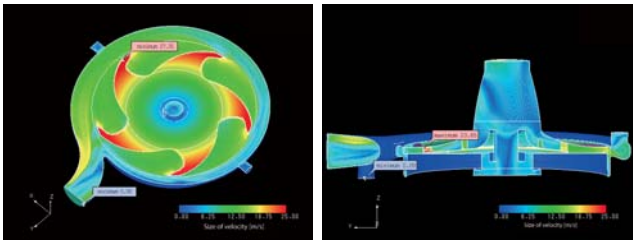


*SC/Tetra was used to conduct the analysis above

Analysis results



Total pressure distribution (400 L/min)



Velocity distribution (400 L/min)

Customer Comments

It is difficult to experimentally evaluate the complex flow phenomena occurring inside a high-speed rotating pump. This is where CFD analysis can be very effective for providing insight about the flow's behavior inside the pump. The pump's calculated pressure versus flow curve agrees well with the experimental values although some values were estimated slightly larger. This has helped us understand the overall tendency of the pump performance.