

Close-Clearance Impeller Types

Anchor Impeller



Anchor impellers are used specially for highly viscous flow, typical of polymer reactions. The viscosity is normally in the range 5,000-100,000 cp. Since this range of viscosity describe highly viscous flows, the reactions for anchor agitated systems are normally carried out under laminar flow. This work presents a detailed computational fluid dynamics (CFD) approach to study the behaviour of stirred vessels using anchor impellers.

The axial plane of the tank, which is being modelled, is divided into small control volumes, which collectively is referred to as the mesh, or grid. In each of these cells the momentum balance, energy and mass conservation, which describes the model, are rewritten algebraically using the finite volumes method to relate such variables as velocity, pressure and temperature to values in neighbouring cells. The equations are then solved numerically, and the results yield the flow corresponding to the model. Since the geometry of a vessel with anchor impellers strictly calls for a three dimensional method, an approximation is made to account for the effect of the blades.

The main objective of this work is to give a detailed description of the flow generated by this axial impeller with a view to indicate ways in which the design and operation of these systems can be improved.

Advantages

- Anchors are close-clearance impellers that fit the contour of the vessel.
- Anchors obtain adequate mixing under the laminar flow conditions encountered in high viscosity applications.
- There are many applications that other agitators are integrated with the anchor.
- These impellers sweep the whole wall surface of the vessel and agitate most of the fluid batch through physical contact.

Technical features

- Anchor impellers are used for liquid viscosities between 5,000 and 100,000 cp.

Applications

- Most chemical process industry plants for high viscosity mixing applications: polymer industries and food industry plants for high viscosity mixing applications such as creams, lotions, ink, paint, sauces, pastes, adhesive, etc.