

AIM OF THE EXPERIMENT : To study the construction and operation of a 'PADDLE MIXER'

CONSTRUCTION AND OPERATION :

A paddle mixer is an apparatus for mixing. It consists of a tank, usually cylindrical in form with a mixing paddle, mounted on a shaft and inserted at the centre. The top of a vessel may be open to the air but more usually it is closed. Here in the model observed the top is open. The tank bottom is rounded to eliminate sharp corners. The shaft is driven by a motor to which paddles are connected. The rotational motion which helps in mixing the fluid with the paddle shaft arrangement. Two bladed and four bladed paddle are common. They turn at slow to moderate speed in the centre of the vessel and push the liquid rapidly and tangentially. The current they generate travel outwards the vessel wall and then either upward or downward. In the tank several paddles may be mounted one above the other on the same shaft.

Industrial paddle agitator turn at speeds between 20 and 150 rpm. The total length of the paddle impeller is typically 60% to 80% of the inside diameter of the vessel. The width of the blade is $1/6^{\text{th}}$ to $1/10^{\text{th}}$ of its length. At very low speed paddle gives mild agitation in an unbaffled vessel, at higher speeds baffles become necessary for proper mixing. Otherwise, the liquid is swirled around the vessel, but with the little mixing. Accessories such as inlet and outlet lines, coils, jackets and wells for thermometer and other temperature measuring devices etc if required are usually included in the assembly of the paddle mixture.

METAL OF CONSTRUCTION :

The materials of construction of paddle mixer is usually steel which form main parts of the cylindrical body and paddle. Cast iron is also used for the stand and other machine parts.

PRECAUTIONS:

1. Proper amount of power must be applied to the mixer for smooth running and proper mixing.
2. Proper lubrication of the rotating machine parts must be done for good functioning of the mixer giving maximum efficiency.

3. Proper specifications of the paddle blades, tank etc of the mixer must be maintained along with the right type of feed material for mixing and agitation to be nicely and thoroughly done.

4. Moderate speed of rotation of the paddles in the shaft to be maintained for the efficient mixing.

INDUSTRIAL USES:

Paddle mixers are used for mixing dry materials such as coffee, sugar, minerals, chemicals, paints, food as well as pharmaceutical products. They may also be used for kneading.

DIAGRAM:

