



FEDA, Inc.

Process Systems Supplier



**ONE STOP SOLUTION
TO ALL YOUR
MIXING NEEDS**

**“COMPROMISATION IN THE
MIXING TECHNOLOGY IS A
COMPROMISATION WITH THE
PROCESS RESULTS”**



FEDA, Inc.
Process Systems Supplier

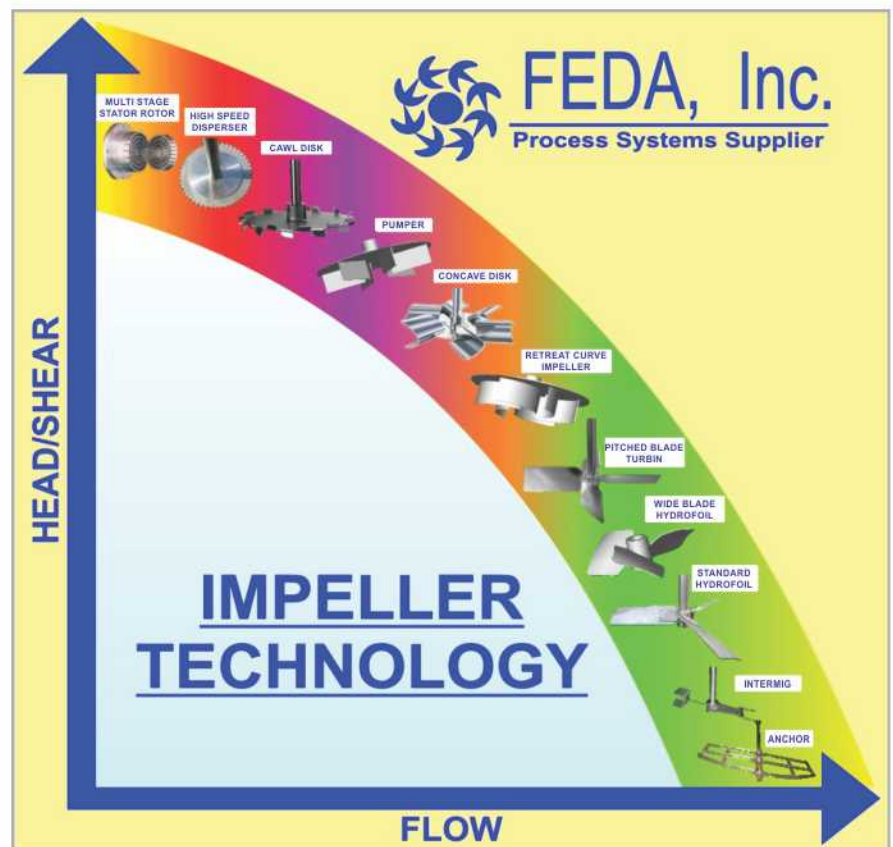
FEDA is a team of successful technocrats who provides world class process equipment solutions for wide range of chemical process industries. FEDA distinguishes itself from its competitors with pioneer approach as designer, manufacturer and after sale service provider. Our approach to solve the customer mixing problems using fundamental approach have placed us as preferred choice in agitators & mixers within a very short span of time.

WHAT FEDA OFFERS:

At FEDA Inc, we provide all internationally available impeller technology and application guidelines under one roof.

Key to success of any Chemical Process Industry is reaction vessel and key to an efficient mixing system is its impeller. Impellers are flow generating devices by mechanical means.

There are various types of impellers and each impeller was developed to get desired process result. All impellers produce flow and generate shear for the given power input to the impellers. Given chart depicts different type of impellers with varying amount of Head/Shear Vs Flow which is just indicative. Please contact FEDA for further information.



VARIOUS MATERIAL OF CONSTRUCTION

SS 304 | SS 316 | HASTELLOY | INCONEL | TITANIUM | MS | MSRL | MSRL + HDPE
FRP LINED | HALAR / ANTI STATIC HALAR | TEFZEL | RUBY RED (PFA)

**“COMPROMISATION IN THE MIXING TECHNOLOGY IS A
COMPROMISATION WITH THE PROCESS RESULTS”**



IMPELLER TECHNOLOGY

HYDROFOIL IMPELLERS

These are most efficient axial flow impeller. It is recommended for blending, solid suspension, heat transfer etc. It provides maximum flow at minimum power. Mostly available in three blade version. But different number & width of blade are also common in special applications. This is also called as fabricated propeller



PITCHED BLADE TURBINES

These are axial flow impeller with considerable amount of radial flow. It produces suction when placed near the liquid surface. Hence used for blending of immiscible liquids, solid incorporation etc. It is also a preferred choice for applications where the viscosity change during the process is large. These are mostly available in four blade @ 45 degree. But different no of blade with various angles are also used depending on application.

COUNTER-FLOW IMPELLERS

Flow generated by impellers tip is opposite to the bulk flow produced by the central part. In many case where the slurry fluidity reduces due to high solid concentration. Tip of the impeller provides momentum to the fluid near vessel wall. These are mainly used for slurry with high solid concentration. It efficiently operates at much higher impeller to tank diameter ratio and have higher flow capacity than conventional impellers.



DISK IMPELLERS

Mostly used for gas dispersion application. Curve blade (Concave, parabolic etc.) disc can handle 2 to 6 times more gas than flat blade disk turbine. Power drop between gassed and un-gassed condition is very less than conventional flat blade disk impellers. Hence it is preferred choice for gas dispersion applications viz. Fermentation, Hydrogenation, Oxidation, Carbonisation, Ethylation etc.

HELICAL RIBBON

Helical ribbon impellers are designed especially axial and overall movement of the liquids. Such an impeller can be designed with an additional inner helix or auger used to pumping in the opposite direction. This is needed for the mixing of high viscosity materials. These impellers can also have one or two start helix. The quality of the final mixed product in these applications are very critical. Wall scrapers can be mounted on the impeller blades to improve heat transfer and homogeneity in sticky products.



ANCHOR / GATE TYPE IMPELLER

Anchors/Gate type impellers are close-clearance impellers that fit the contour of the vessel. These impeller provide adequate mixing under the laminar flow conditions encountered in high viscosity applications for heat transfer. There are many applications that other type of impellers 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. Anchor impellers are used for liquid viscosities between 5,000 and 50,000 cP. When reaction/mixing homogeneity is required, other type of impellers are recommended.

HIGH SHEAR IMPELLER

Disperser disk provides large amount of shear and mostly used for liquid-liquid dispersion, powder dissolution or de-agglomeration etc.



STATOR ROTOR

Stator rotor is used when shear requirement is very high and desired particle size are in micron or submicron range. Colloid mill or other types of mills are used for still higher shear rates and sub micron level particle size.

**“COMPROMISATION IN THE MIXING TECHNOLOGY IS A
COMPROMISATION WITH THE PROCESS RESULTS”**



FEDA, Inc.
Process Systems Supplier

FEDA STATOR ROTOR TECHNOLOGY

Tremendous amount of shear is required to produce stable emulsion and fine dispersion. Hence all the impeller blades are designed at high tip speed and high shear rate.

For low and medium viscosity fluid Premixing and De-agglomeration of particles to very fine and stable dispersion is a well known use.

For high viscosity fluids co-axial or multi-shaft agitators are recommended with stator rotor or pump may be used for flow through inline homogenizer.

These machines are used for producing stable emulsions and very fine dispersion in micron range. Ultra high shear mixers can be used for sub micron range dispersion and emulsification (depending on the nature of the product). Trial on our pilot scale batch homogenizer or inline homogenizer is recommended for predicting the actual performance on the plant scale.

Standard machines can be used for most of the application. However, a tailor made custom design may be recommended to meet customer special needs.

WORKING PRINCIPLE:

Rotor moves inside a stator at very high peripheral velocity which produces intense hydraulic shear which is required for emulsification and very fine and stable dispersion. Fluids are drawn at centre of the high speed rotor where it experiences very high mechanical and hydraulic shear due to centrifugal force and small clearance between the stator & rotor



BATCH TYPE STATOR ROTOR



MULTI SHAFT AGITATOR



CO AXIAL AGITATOR



BATCH / CONTINUOUS
IN LINE HOMOGENIZER

**"COMPROMISATION IN THE MIXING TECHNOLOGY IS A
COMPROMISATION WITH THE PROCESS RESULTS"**



FEDA, Inc.
Process Systems Supplier

TYPICAL APPLICATION OF STATOR ROTOR TECHNOLOGY

De-agglomeration | Dispersion | Particle size reduction | Droplet size reduction | Emulsifying
Homogenizing | Dissolving | Hydrating Powder / Liquid Mixing

FOOD

Production of cream
Flavoured Milk
Hydration of Stabilizers & Emulsion
Hydration of Xanthan gum
Production of Mayonaise,
Salad dressing, tooth paste
Tomato sauces & ketchup

PHARMACEUTICAL

Production of cream,
ointments and lotions
Tablet coatings
Manufacture of syrup
Various formulations

CHEMICAL

Manufacture & formulation of
Pesticides
High speed dissolving & Hydrating
Polymer & Pigment dispersion
Dispersion of Bentonite,
Fumed Silica, Xanthan gum

COSMETICS

Shampoo
Toothpaste
Creams & lotions
Lipstick

ADVANTAGES OF STATOR ROTOR TECHNOLOGY :

- CIP (Cleaning In Place) design
- Reduces production time, Equipment cost and operating cost.
- Quickly reduces the agglomerates to very fine and stable dispersion
- Tremendous amount of energy input to the process fluid by specially designed impeller blades gives faster and superior result.

DON'T CONFUSE WITH MYRIADS OF IMPELLER, WE WILL SELECT THE RIGHT ONE FOR YOU



Fine Stator



Sawtooth



Single Stage Pumper



Slotted Impeller



Multi Stage Slotted

VARIABLES THAT AFFECT THE PERFORMANCE

Tip speed | Clearance between the stator and rotor | Configuration of stator and rotor
Flow rate / residence time | Power Input | Turn Over Rate (TOR) | Liquid / Powder
characteristic at process conditions

MATERIAL OF CONSTRUCTION

All grade of stainless steel, hastelloy, inconel etc.



FEDA, Inc.

Process Systems Supplier

RANGE OF PRODUCTS

Agitators & Mixers

Reaction Vessels

Pressure Vessel

Receivers

Heat Exchanger

High Speed Dispenser

High Shear Mixers

In-line Homogenizers

Ribbon Blender

Plough shear Mixer

Fluid Bed Dryers

Vacuum Tray Dryers

Rotary Vacuum Dryers

Process Filters

Stainless Steel Filters

Candle & Cartridge Filters

REGISTERED OFFICE & WORKS :

FEDA, Inc.

B/37, Maruti Industrial Estate,
Plot No 59/1/2/3, Phase-1, GIDC Vatva,
Ahmedabad -382 445, Gujarat (India)
(M) 8866145400/ 9426679554
Email : ashok.chaurasia@gmail.com,
ashok.chaurasia@fedainc.com
fedainc@gmail.com
Website : www.fedainc.com

Local Representative :