NAPRO
Total Process Solutions

NAVIN PROCESS SYSTEMS

6, Vaidehi Residency, MIT College Road, Rambaug Colony, Kothrud, Pune – 411 038, India
Tel./Fax : 91-20-25460214 E-mail: info@napro.co.in URL : http://www.napro.co.in

PROCESS DESIGN

We specialize in the design & manufacture of a variety of chemical process equipments. A brief description of the same is given below :-

1. Reactors :-

We have designed a number of reaction vessels with capacities ranging from a few litres to over 100 m^3, for a variety of process for the chemical, pharmaceutical & fermentation industries.

Some of the special applications include :

1. Continuous stirred tank reactors (CSTR)
2. Plug flow reactors (PFR's)
3. Autoclavable stirred tank reactors
4. Glass lined reactors
5. Fluidized bed reactors

2. Agitators :-

We have designed agitators for standard as well as novel applications, using both mechanically coupled agitators (with stuffing box or mechanical seal) as well as magnetically driven agitators (top, bottom & side mounted). Rushton turbine impellers (with flat, inclined & curved blades, with/without central disk), marine propellers, anchor impellers & hydrofoils can be designed. We are fully conversant with novel agitator designs such as centrifugal (or rotating) bed basket agitators. We have designed agitators from 0.25 HP to over 300 HP

3. Corrugated tube heat exchangers :-

Corrugated tube heat exchangers (CTHE) offer immense benefits over conventional heat exchanger designs such as tubular & plate heat exchangers

Salient Features	Advantages over conventional heat exchangers
1. High turbulence is induced at lower velocities due to the corrugations	▪ Lower pumping costs ▪ Thermal efficiency is greatly increased

	▪ Fouling is greatly reduced ▪ Product channeling is eliminated
2. Thermal efficiency is greatly increased	▪ Much less heat transfer area is required ▪ Smaller heat exchangers can be used as compared to plain tube heat exchangers
3. High heat transfer coefficients	▪ Closer temperature approaches between product and service fluids can be obtained
4. Low fouling	▪ Long running times can be achieved ▪ Easy to clean; dismantling not required for cleaning
5. Higher working temperatures and pressures can be tolerated	▪ Can be used for virtually any process right from boiler economizer upto the most difficult chemical processes

In addition to the above, the equipment is modular, compact & can be manufactured in a wide range of capacities.

Some of the applications of corrugated tube heat exchangers are as follows :-

1. Fruit pulp pasteurization
2. Edible oil deodorization
3. Fermentor media sterilization
4. Evaporation
5. Concentration
6. Falling film evaporators
7. Rising film evaporators

We have designed corrugated tube heat exchangers of various sizes from 1 m^2 to 100 m^2 heat transfer area.

Other equipments :-

We have designed a number of process equipments other than those described above. Some of them are as follows :-

1. Crystallizers
2. Evaporators
3. Fluidized bed dryers
4. High temperature & high pressure stirred tank reactors (autoclaves)
5. Crossflow filtration systems

4. Innovative products :-

Apart from standard equipments, we also have designed & manufactured several innovative equipments for specific process applications. We have applied for a patent for some of the products :-

1. Automatic flyfood maker system
2. Autofeed dosing kit for fermentors
3. Autoclavable stirred tanks & pressure vessels
4. Dinitrogen pentoxide manufacturing plants
5. Low-cost biofertilizer manufacturing machinery
6. Laboratory & pilot plant fermentation systems