



PRESSURE and FLOW Reactors

About **AMAR**

50
+

Years of experience

250
+

Expert team

2500
+

Customers globally

7500
+

Successful installations

Largest exporter of pressure & flow reactors in India

Inline with government's MAKE IN INDIA campaign

Exports to over 50 countries worldwide

Expertise in custom designing, high pressure & flow systems

Well equipped flow chemistry process development lab

Manufacturing on CNC, VMC & automated machines

Unmatched quality & safety standards

Prompt & efficient after sales service

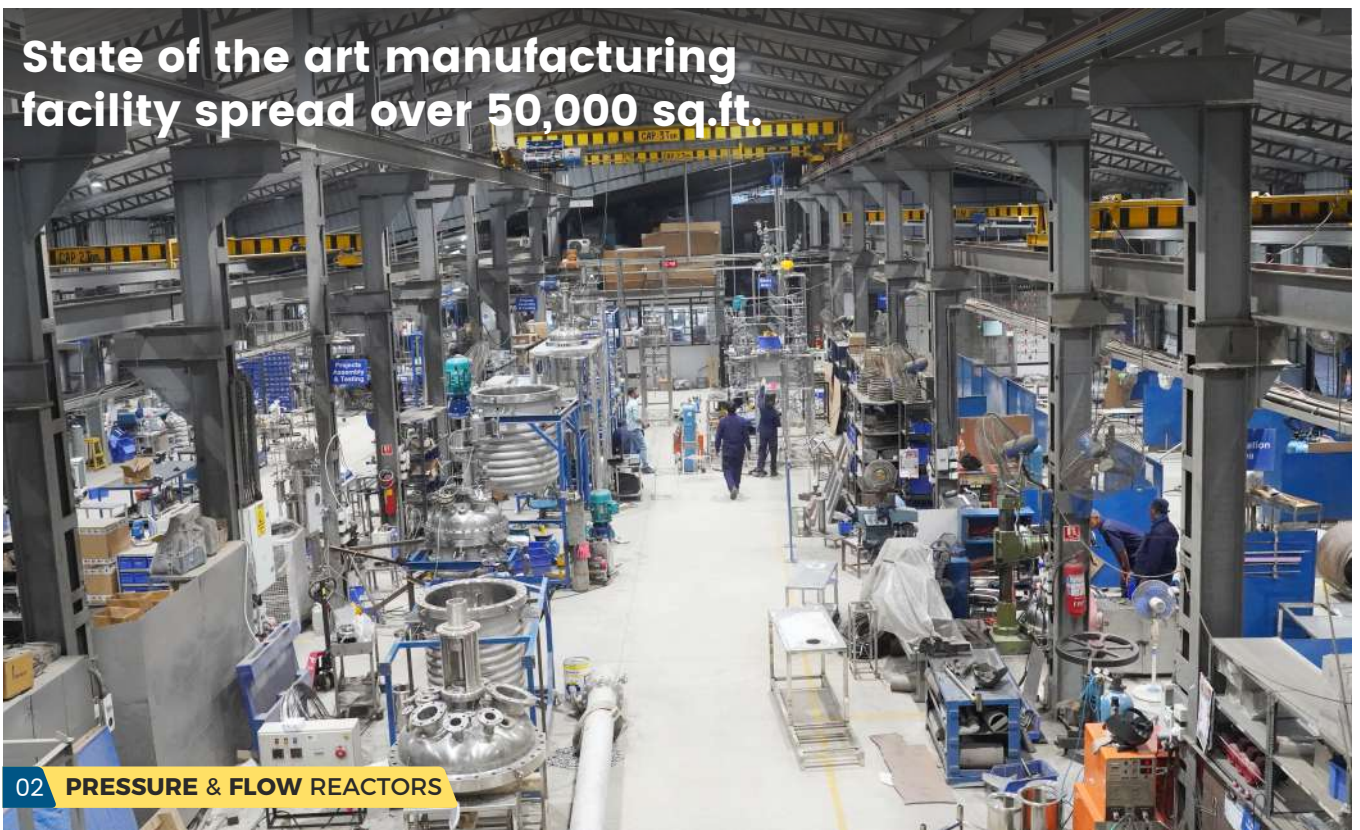
ISO, PED, ASME U, CE, CSA, UL, Ex-proof, ATEX certification



Our **VISION**

To be a globally leading provider of innovative, cutting edge products and services, thus empowering clients to achieve enhanced efficiencies, sustainability and technological advancement.

State of the art manufacturing facility spread over 50,000 sq.ft.





Pressure Reactors



Flow Reactors



Pilot Skids

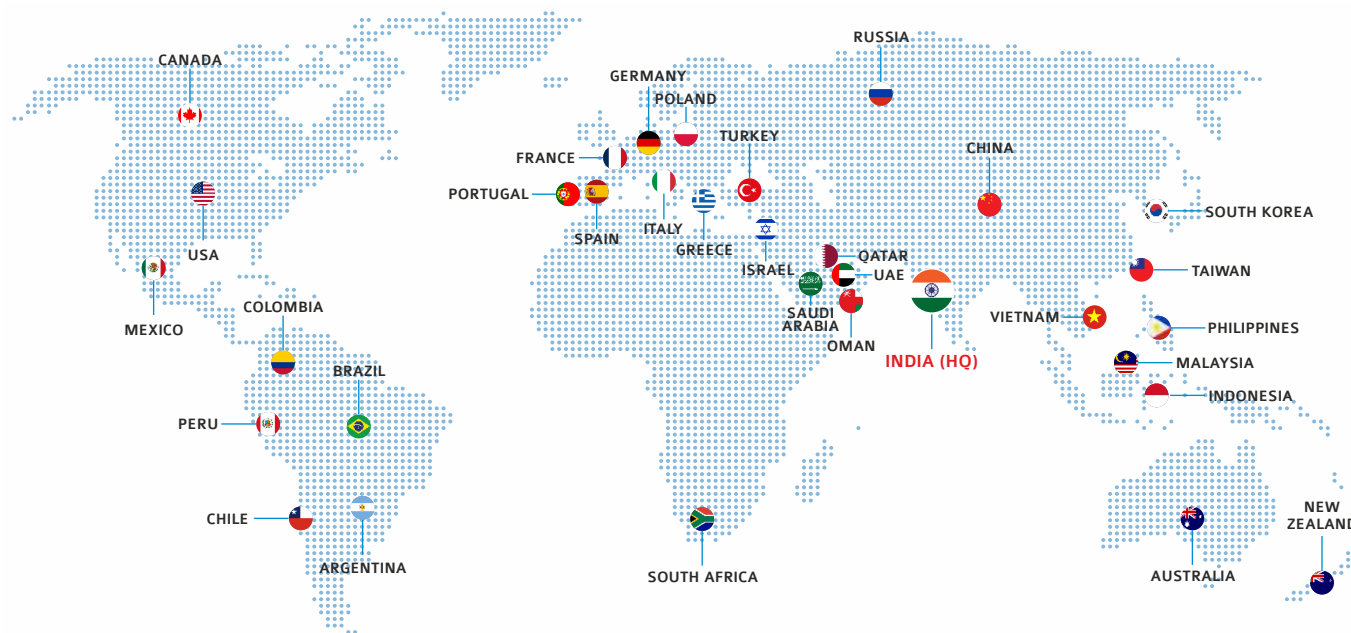
Your one-stop-shop for reaction requirements with off-the-shelf products & tailor-made solutions. expertise of mechanical, chemical, instrumentation engineering & chemistry under one roof

Flow chemistry process development lab

Convert your batch chemistry to flow from concept to commercialization.



Global Presence



STIRRED PRESSURE AUTOCLAVES



- Volume: 100mL to 100L
- Up to 350 bar @ 500°C
- SS-316, Hastelloy, Inconel, Monel, Titanium, Zirconium.
- PED / ASME U-Stamp, CE / CSA, Ex-proof / ATEX
- Programmable touch screen panel with SCADA software for data logging & wireless remote control.

PLANT SCALE PRESSURE REACTORS



- Volume: 100L – 1,000L
- Up to 100 bar @ 300°C.
- SS316, Hastelloy, Inconel, Monel, Titanium, Zirconium.
- High mass transfer gas induction / PBT impeller.
- Zero leakage magnetic coupling.
- PED / ASME U-Stamp certified.

MULTIPLE PARALLEL REACTORS



- 4 or 6 parallel reactors with overhead stirring.
- Volume: 100mL – 2L
- Up to 350 bar @ 500°C.
- SS316, Hastelloy, Monel, Inconel, Titanium, Zirconium.
- Fully automated with SCADA software.
- React-7, 25mL x 7 nos. bottom stirred parallel reactors.
- For high throughput screening.

PRESSURE VESSELS / HYDROTHERMAL AUTOCLAVES



- Volume: 25mL – 1,000L
- Up to 700 bar & 600°C.
- SS316, Hastelloy, Monel, Inconel, Titanium, Zirconium.
- PED / ASME U-Stamp, CE / CSA, Ex-proof / ATEX.
- 25mL to 750mL acid digestion bombs.
- Applications: Gas / liquid storage, charging, separation & collection, gas hydrate formation, hydrogen induced disbonding tests, soaking of precious stones, etc.

SUPERCritical FLUID (CO₂) EXTRACTION



- Volume: 100mL – 1,000L
- Up to 700 bar.
- Feed capacity of 0.24 to 2,400 Kg/day.
- For extraction of herbs, spices, essential oils, oleoresins.
- For extraction of flavours, fragrance & colours.
- Decaffeination of tea & coffee.
- Textile dyeing of fabrics, drying of aerogels.
- Synthesis of nano particles

HPHT CORROSION TESTING



- Volume: 500mL – 100L
- Up to 350 bar & 600 °C.
- Material: SS316, Hastelloy C, Inconel, Titanium
- For static, dynamic, recirculating loop & electrochemical corrosion studies.

MAGNETIC DRIVE COUPLINGS / STIRRERS



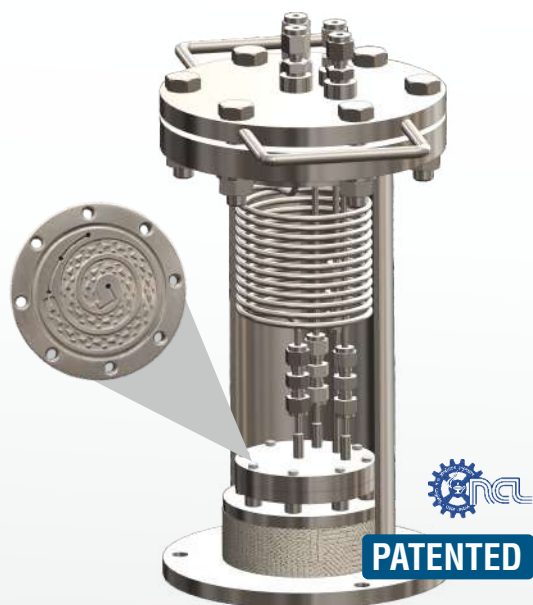
- For reactor volume: 50mL to 10,000L
- For full vacuum to 700 bar pressure.
- For high vacuum distillation in round bottom flask.
- Material: SS316, Hastelloy C, Inconel, etc.
- Mixer / agitators with inline motor & coupling.
- High torque coupling up to 1000 Nm.

AGITATED NUTSCHE FILTER & DRYER



- 1L – 100L slurry volume.
- Design pressure: -1 to 4 bar.
- Design temperature : - 20°C to 150°C.
- Material: SS316, Hastelloy C.
- 0.005 m² to 0.5 m² filtration area.

LabFLO™ REACTOR



- 1mL micromixer + 10mL residence coil
- Flow rates up to 6 LPH
- Up to 50 bar & -50°C to 350°C.
- Material: SS316 / Hastelloy C.
- Screening tool for continuous flow feasibility studies
- Suitable for reaction of miscible, immiscible liquids & gases

MicroFLO™ REACTOR



- Volume: 5mL to 2L
- Flow rates up to 100 LPH
- Up to 100 bar & -50°C to 350°C.
- Material: SS316 / Hastelloy C.
- 3D printed microreactors.
- Ideal for fast liquid-liquid reactions with high exothermicity.

PinchFLO™ REACTOR



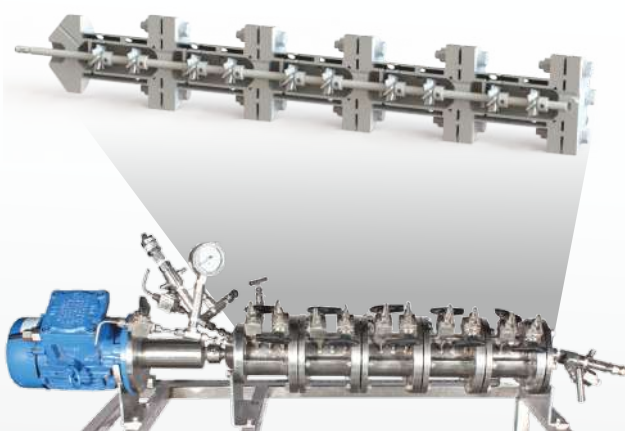
- Volume: 50mL – 1,000L
- Flow rates up to 10,000 LPH
- Up to 100 bar & -50°C to 350°C.
- Material: SS316, Hastelloy C.
- Lab to production scale versatile reactor suitable for various liquid-liquid or gas-liquid exothermic reactions, liquid-liquid extractions.

CorFLO™ REACTOR – STATIC MIXERS



- Static mixer elements for better mixing in tube with high heat transfer.
- Volume: 50mL – 1,000L
- Flow rates up to 10,000 LPH
- Up to 100 bar & -50°C to 350°C.
- Material: SS316, Hastelloy C.
- Ideal for pilot to plant scale liquid-liquid, gas liquid & slurry applications.

SlurryFLO™ REACTOR



- Volume: 250mL to 50L
- Up to 100 bar & -30°C to 250°C.
- Material: SS316, Hastelloy C.
- Multiple agitated cells connected in series.
- Each cell temperature control and sampling.
- Ideal for slurries, hydrogenation, crystallisation & reactions with high residence times.

CONTINUOUS STIRRED TANK REACTOR



- Volume: 100mL to 1,000L
- Up to 350 bar @ 500°C.
- SS316, Hastelloy C.
- Single or multiple reactors connected in series.
- Ideal for slurries, hydrogenation, etc.

VishwaFLO™ REACTOR



- Volume: 250mL to 50L
- Flow Rates: Up to 300 LPH
- Pressures: Up to 350 bar
- Temperature: -30°C to 350°C
- Materials: SS316, Hastelloy C, etc.
- Applications: Reactions involving slurries, viscous fluids, gas-liquid-solid contacting, fast exothermic reactions, long residence time reactions and continuous crystallizations

PhotoFLO™ REACTOR



- Volume: 12mL to 200mL microchannel reactors
- Flow Rates: Up to 20 LPH
- Pressures: Up to 20 bar
- Temperature: -20°C to 200°C
- Material: SS316, Hastelloy C & Glass
- Variable wavelength LED Light Source
- Applications: Photo halogenations, Photo alkylation, Photo-oxidation, etc.

FIXED & FLUIDIZED BED REACTOR



- Volume : 10mL to 100L
- Up to 350 bar & 1100°C
- Solid feed: Batch / continuous
- Material: SS316, Hastelloy C, Inconel, etc.
- Application: Catalyst screening, biomass gasification, hydrogenation, coal to syngas production, pyrolysis reactions, fischer-Tropsch process, vapor phase reactions, liquefaction reactions, hydrocracking, etc.

PascalFLO™ PUMP



- Flow rates: Range from 1mL/min up to 100LPH
- Pressures: Up to 100 bar
- Temperature: Up to 350°C
- Material: SS316, Hastelloy C
- Controlled dosing/pumping of any type of liquid or slurry
- Accurate flow control without controllers on the liquid lines
- Operated by controlled gas flow

HEATING COOLING CIRCULATORS



- Single fluid closed loop circulators: -90 °C to 250 °C.
- Heating cooling circulators: -70 °C to 175 °C.
- High temperature circulators: Ambient to 350 °C.
- Chillers: Up to -15 °C.
- CE marked units & **NATURAL** refrigerant optional
- With accurate programmable temperature controller & touch panel

NANOMAKE™



- Microfluidic platform for nanoformulations
- Flow rates: 100µL/min to 50mL/min
- No. of pumps (precursor): 3
- Single-use and multi-use microreactor with different internal volumes
- Nanomaterial synthesis: Lipid, Polymer, Metal

Thinking **FLOW** ? Think **AMAR** !

Your-One-Stop-Shop for flow chemistry from Concept-to-commercialization



Lab facility

- State of the art flow chemistry process development lab with wide choice of indigenous flow reactors, pumps & utilities.
- In-house analytical facilities.

Services offered

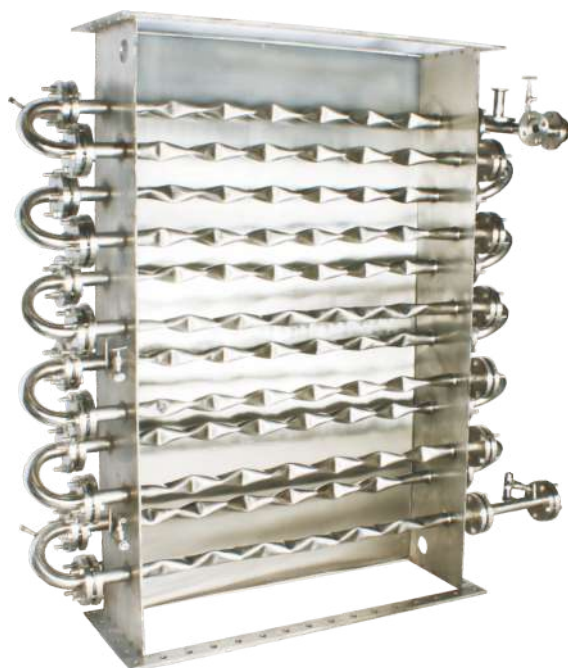
- Proof of concept studies from batch to flow
- Project based process optimization
- Flow process development up to commercial scale

Nitration Amination Hydrogenation **Oxidation**
 Hydro-cracking **Crystallization** **Acylation**
 Halogenation **Esterification** Azo coupling Alkylation
 Sulfonation Acetylation Cyclization
 Neutralization Pyrolysis Methylation Ozonolysis
Lithiation Biomass gasification
 Sulfoxidation Fischer-Tropsch **Grignard**
Amoxidation **Diazotization** Liquefaction

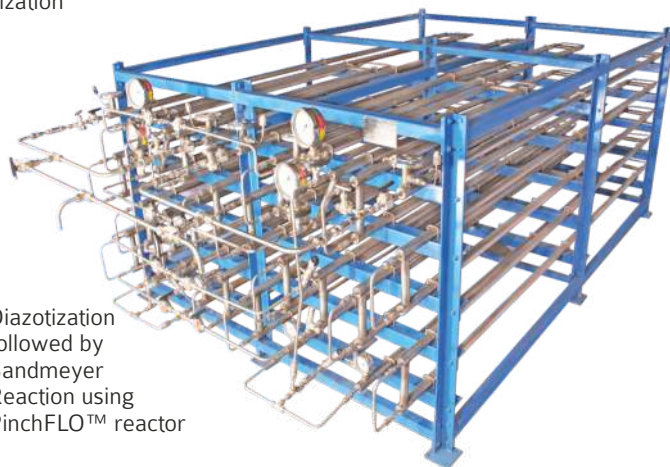


Scaled-up Flow Reactors

Amar has expertise to design, manufacture & integrate commercial flow reactor systems with pumps, accessories, utilities, automation on a common skid up to 10,000 LPH for various applications.

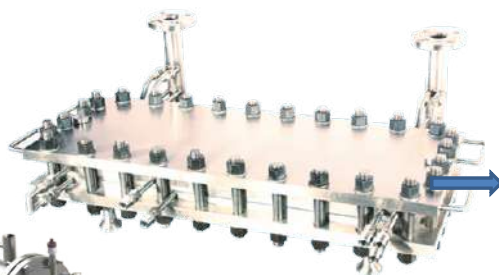


PinchFLO™,
12L Neutralization
4 tons/day
throughput

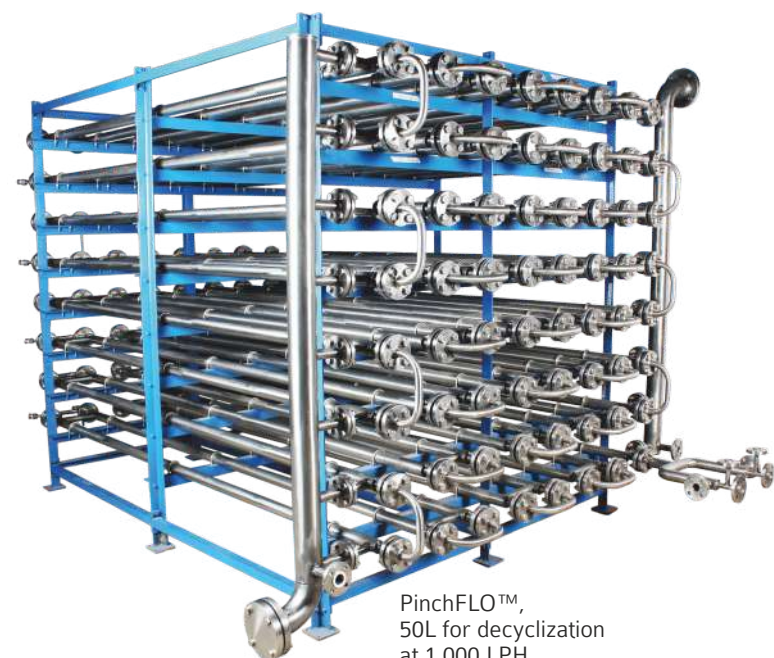


Diazotization
followed by
Sandmeyer
Reaction using
PinchFLO™ reactor

PinchFLO™ reactor used
for amination reaction,
throughput 1 - 10 kg/hr.



MicroFLO™ + PinchFLO™
for nitration reaction
at 10 tons/day



PinchFLO™,
50L for decyclization
at 1,000 LPH



PinchFLO™,
2L Acetylation
at 100 LPH



Customised Flow Reactor Systems



Complete turn-key solutions from lab to plant scale can be offered with desired design, safety & hazardous area certification.



50mL MicroFLO™ microreactor in series (2 nos.) with feed pumps



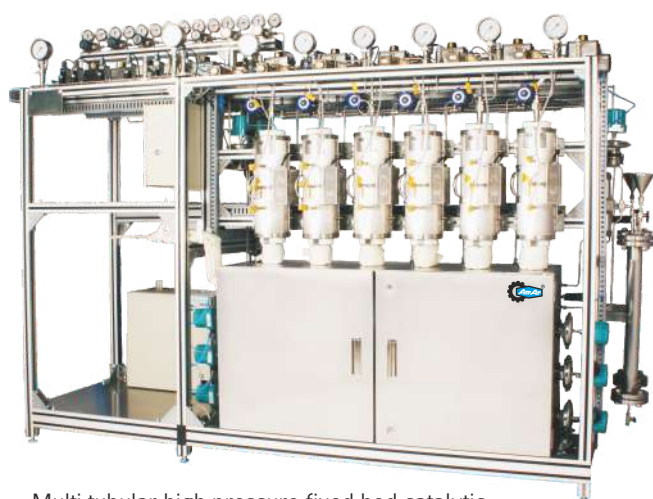
Hybrid pilot scale setup for Saponification using 2.5L VishwaFLO™ & PinchFLO™ reactors



High pressure CSTR for hydrogenation



Pilot scale tubular reactor with purge panels for continuous biojet fuel production



Multi tubular high pressure fixed bed catalytic parallel reactor system



Fluidized bed gasification facility



High Pressure Customized Systems

Amar has expertise to design, manufacture & integrate customised high pressure reactor systems with all accessories, utilities, automation on a common skid for various applications.



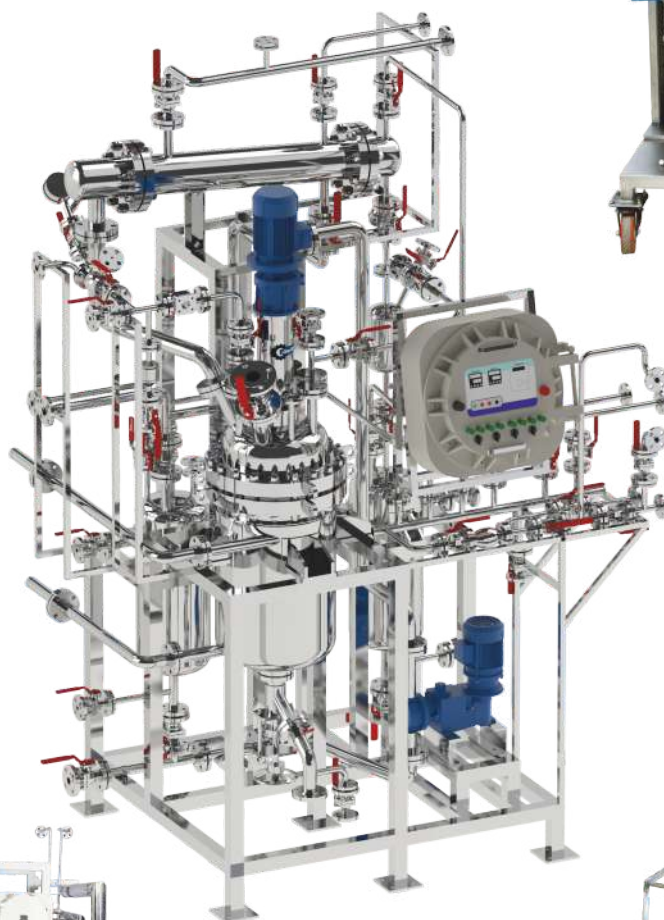
Continuous emulsion polymerization pilot plant



Multipurpose pressure reactor with column & distillation assembly



10L pilot plant for ethoxylation



300L Ex-proof pilot plant with pump, condenser, phase separator & receiver vessel



20L high temperature pilot plant

100L polymerization reactor for 20,000 cP viscous polymer with vessel raising, lowering & tilting



Automated & Ex-proof Pilot Plants



Complete turn-key solutions can be offered for lab to plant scale with desired design, safety & hazardous area certification.



25L reactor with pneumatic raising lowering & tilting



High pressure Ex-proof distillation skid



100L Ex-proof hydrogenation pilot plant with catalyst filter & recycle, auto-cooling system, vacuum pump & catch pot.



Ex-proof pilot plant for EO-PO reactions



10L Fully automated Ex-proof alkoxylation pilot plant



Fully automated & semi continuous pilot plant for styrene butadiene emulsion polymerization with pneumatic vessel raising, lowering & tilting



Ex-proof autoclave with load cell arrangement



Our Valued Clientele



Our Valued Clientele



Client Testimonials

"Product quality is very nice and available within committed time frame, All the Equipment received from Amar is very reliable in performance. Service from Amar is always appreciated. "Excellent service !!!!!!!!!!"

Dr. Dahyabhai Tandel,
Head Development Manager,
Bayer Limited

"We have been dealing with Amar Equipment for long time. Overall, I can say that Amar Equipment is a very Reliable, progressive and Innovative Equipment manufacturer and willing to make extra efforts to develop new design and also fairly economic in comparison to international manufacturers."

Dr. Chinmoy Nandi,
V.P.-R&D, NOCIL LTD

"The quality and performance of the supplied system is excellent and was delivered within the stipulated time frame. We have no hesitation recommending Amar as a quality supplier of high value orders."

Solvay Research and Innovation Center



AMAR EQUIPMENT PVT. LTD.

📍 Valson Compound, LBS Road, Bhandup (W), Mumbai - 400078, INDIA.

☎ +91-22- 6225 5000 🏠 www.amarequip.com ✉ sales@amarequip.com / export@amarequip.com