



The Transparent Specialist

A BOROSIL Scientific Company

Standard Units

Heat Exchanger

Rotary Evaporator

Nutsche Filter

HCL Purification Unit

Bromine Recovery

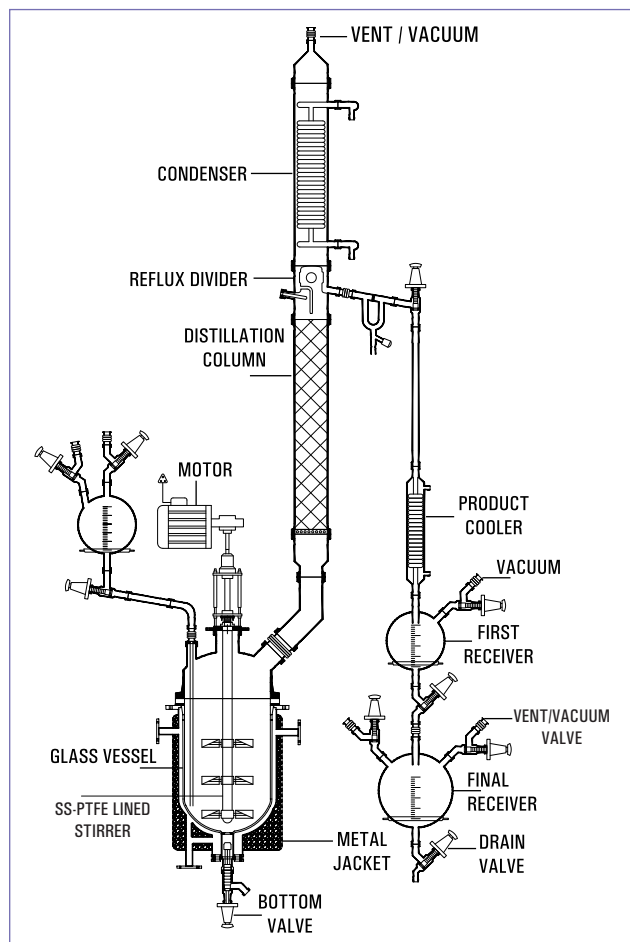
HCL Gas Generator

Leading
Scientific Process
Systems Manufacturer

Borosilicate 3.3 Glassware

METAL JACKETED WITH GLASS REACTOR

BOROSILICATE GLASS 3.3



According to the customer's requirements and standards, we manufacture jacketed glass reactor which has many functions to satisfy kinds of experiments.

Goel Scientific offers a Glass Reactor with a Metal Jacket for process development in the chemical and pharmaceutical industries. The glass reactor will have a metal jacket and metal insulation.

Glass Metal jacketed Reactor 5-200 liter

Pressure:- up to 1 Bar

Temperature:- -50°C to +200°C

Material: Borosilicate glass 3.3 /PTFE/ SS 316.

Key Features:

- Reactor lift for easy opening i.e optimised for easy vessel cleaning.
- Temperature monitoring and control.
- Gas purging available.
- Vacuum / exhaust piping arrangement.
- Additional feeders / receivers as per requirement.
- Solid feeding arrangement.
- Ready for Cryogenic reactions (-50°C).
- Mixed systems with pressure reactor and vacuum distillation.

1. Simple Distillation Unit

2. Reaction Unit

3. Fraction Distillation Unit

4. Reaction Distillation Unit

5. Liquid-Liquid Extraction Unit

6. Solid-Liquid Extraction Unit

Assembly over GLR



1. Assembly over GLR

2. Gas Scrubber

3. Multi Purpose Unit

4. Mobile Mixing System

5. Jacketed Mixing Reactor

We form a combination of Chemical Engineers in the field of Process engineering and its application in the glass equipment/process packages.

DESIGN AND SUPPLY OF VARIOUS

UNITS as per client's requirement are as under:

1. Absorption systems for gases such as HCl, Cl₂, SO₂, HBr, NH₃, Br₂, NO_x etc.
2. Anhydrous HCl Gas Generation Unit by different routes viz.
 - Sulphuric Acid Route
 - Boiling Route
 - Calcium Chloride Route
 - Cyclic Route
3. HBr Gas Generator (By Boiling Route)
4. Sulphuric Acid Dilution Units.
5. Hypochlorite Manufacturing Units
6. MCA Condensation Assembly
7. Distillation - Conversion of Batch Process to Continuous Process.
8. Solvent Recovery
9. Iodine Recovery
10. Raw DCB Plant.

Wiping Film Evaporator

Falling Film Absorber

Sulphuric Acid Concentration System

Bromine Recovery System

Anhydrous HCL Gas Generation Unit

Anhydrous HCL Gas Generator - Calcium Chloride route

Continuous Distillation System

Solvent Recovery

Rotating Disc Extraction Column

Precious Metal Refining

Nitric Acid Purification System

HCL Purification System

Peptide Synthesizer

HCL Purification System



Peptide Synthesizer



Bromine Recovery Unit



High Pressure Glass Reactor

Operating temperature
-90 °C to +200 °C

T - Thermal Δ
shock resistance
60°C (double wall)



A high-pressure glass reactor is a specialized vessel designed for chemical reactions under elevated pressure, achieved by the reaction itself or externally supplied sources like hydrogen. Operating at temperatures above solvent boiling points, these reactors impact reaction dynamics by increasing concentration and collision frequency among molecules, accelerating reactions.

Versatile Uses

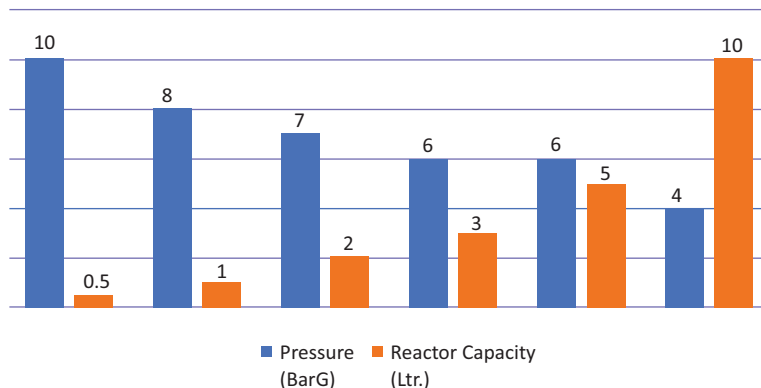
Widely used in industries requiring precise control over reactions, such as organic synthesis and pharmaceutical development, these reactors enable controlled and accelerated reactions for specific chemical compounds. Their controlled environment facilitates efficient exploration and optimization of various chemical reactions.

Catalysis

High pressure primarily accelerates reactions, suppressing competing reactions and maintaining cleaner reaction profiles. While temperature can speed up reactions, it may risk product decomposition. These reactors expedite reactions while preserving specificity and purity.

Vessel Capacity Vs Pressure

Reaction Vessel Shell Side Pressure



Benchtop Jacketed Nutsche Filter



Operating temperature
-40 °C to +200 °C

ΔT - Thermal shock resistance
60°C (double wall)

The **GOEL- A BOROSIL Benchtop Nutsche Filter** is an all-glass filtration device designed for solid-liquid separation applications. Here are some key features and benefits of this filtration system:

- 1. Pressurized Filtration:** The filter can handle pressures of up to 2 bar (2 bar gauge pressure), which is beneficial for accelerating the filtration process. This pressure helps in reducing solvent evaporation, especially at elevated temperatures, making it efficient for separating solids from liquids.
- 2. Controlled Agitation:** The filter is equipped with a flat blade that allows for Agitation. This feature enables gentle mixing of the slurry, dissolution of solids, smoothing of the filter cake. Agitation gives the operator control over the filtration process.

3. High Containment: The Benchtop Nutsche Filter is designed to provide a high degree of containment. This is crucial for processes involving hazardous or sensitive materials where operator safety and product integrity are paramount. The containment feature helps prevent cross-contamination and minimizes product loss.

4. Process Visibility: The filter's all-glass design offers excellent visibility into the filtration process. This transparency allows operators to monitor the progress of solid-liquid separation, ensuring that the desired results are achieved.

5. Optimal Filtration and Drying: The full jacket design allows for precise temperature regulation, optimizing the filtration and drying process. This ensures efficient separation of solids and liquids, leading to high-quality, dry filter cake.

Vessel capacity	Size 100DN - 1 Ltr and 2 Ltr Size 150DN - 3 Ltr and 5 Ltr with "X" strong type Bottom.
Vessel type	Single wall or Double wall (full jacket)
Filtration area	Approx 76.5 cm ² (1 L & 2 L) Approx. 175.7 cm ² (3 L & 5 L)
Operating pressure	Full vacuum to +2 barG (+0.2 MPa)
Operating jacket pressure	Up to +0.5 barG (+0.05 MPa)
Operating temperature	(-40 °c to +200°q
ΔT - Thermal shock resistance	110 °c (Double wall)

Rotary Film Evaporator

2 TO 100 LITERS



INTRODUCTION

A Rotary Film Evaporator is essentially a thin film evaporator. The rotating flask continuously covers a large surface area with a thin film which is ideal for rapid heat transfer. Fortuitously, the thin film also ensures uniform heat distribution without local heating. The facility to work the unit under full vacuum further facilitates evaporation at as low a temperature as possible. That is to say, both boiling point and residence time are significantly reduced. These features combined, render the rotary film evaporator to be ideally suited for evaporation of heat-sensitive material. It is equally successful for the evaporation of suspension in crystallization processes, \ drying of powder/ granules, etc.

Rota Evaporator finds wide use from small-scale laboratory set-ups to industrial operations. Goel Rotary Film Evaporator (GRFE) is preferred by both research and production facilities and has been used by laboratory and chemical, pharmaceutical, and biotechnological industries.

SALIENT FEATURES

1. Universal corrosion resistance.
2. Auto controlled digital display of rotational speed and bath temperature.
3. Digital display of process time.
4. Automatic bath lifting.
5. Automatic bath lowering in case of power failure.
6. Withstands full vacuum.
7. Ideally suited for heat sensitive material.
8. Maintenance free working - Operational reliability.
9. Available in large sizes upto 400 Litre.

Rotary Film Evaporator

200 TO 800 LITERS



INTRODUCTION

A brief Introduction to the evolution of CYLINDRICAL SHAPED Rotary Film Evaporator made of Borosilicate Glass!! - ALL NEW Innovations from GOEL, INDIA.

Rotary Film Evaporator is a regularly used product in the R & D of chemical & pharmaceutical industry. It is also being used nowadays for manufacturing purposes for high-value pharmaceutical & specialty chemical products. The existing rotary film evaporators are used, with spherical evaporating flasks. When the requirement of volume for a process increases it is practically very difficult to handle the sizes beyond 50 Liters.

Chemical reactors are cylindrical in shape, and they generally have a particular L/D ratio for a particular reaction surface area. The cylindrical vessel has a higher surface area than a spherical vessel. This prompted us to think about why only a spherical vessel is used when we can exploit the advantage of a cylindrical-shaped evaporation flask in a rotary film evaporator

Thus the innovation for a better rotary film evaporator with better efficiency in terms of rate of evaporation was done. The results showed that the rate of evaporation was enhanced to 20 % as compared to a conventional spherical-shaped rotary film evaporator. Also, the mechanical stability was far superior to the spherical vessel, inclined drive rotary film evaporator

Then we designed the largest Rotary Film Evaporator **Jumbo Rotary**, capacity of 400 liters made from Borosilicate Glass 3.3 Cylindrical



PIPELINE COMPONENTS



VALVES



VESSELS



STIRRERS



HEAT EXCHANGERS



COLUMN COMPONENTS



STRUCTURE AND
SUPPORTS



CUSTOM GLASSWARE



COUPLINGS & GASKETS

Industries We Serve...

Precious Metal
Industries



Fertilizer
Industries



Chemical
Industries



Perfumery Industries



Research &
Development
Industries



Pigment and
Dyes Industries



Pharmaceutical
Industries



Lighting Industries



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