

FERMENTERS & REACTORS

The consolidation of the
knowledge on your microbial
and cell culturing process and
its bioproduction potential



KGC

EMPOWERING FUTURE
THROUGH RESEARCH & INNOVATION

INTRODUCTION

Welcome to our 2020 - 2021 edition of Product Catalog. We would like to thank you for your continue support and encouragement. Throughout this challenging time, we have grown and transform our business to be more efficient and effective. This will enable us to offer better service and more competitive pricing to our customers.

Our new edition of catalog comes with a easy reference features where we categorized the products into different usage categories, i.e. Advanced Material, Renewable Energy, Bio-Process, Gauge Calibration, Membrane Technology, 3D scanner and others. This will facilitate the users to quickly access to the equipment specification required, and options available to them in term of measuring range or equipment complexity.

In our new catalog, we have also added the equipment to do research in renewable energy like solar cell, fuel cell, flow cell, lithium ion batteries, and membrane technologies. In synergy with our advanced material equipment, we have also added the equipment for material characterization especially in the area of rare earth research and magnetic properties. In line with the manufacturing industry footsteps, the equipment on 3D scanning and 3D printing also have been added in to expand the tools in the research and development for industry 4.0.

To our current customers, we believed our partnership will be strengthen for the years to come. The new catalog will also create new opportunities to build new relationship with new customers.

Lastly, I would like to thanks our staffs for their dedication and sacrifice in supporting the management for a brighter future.

Patrick Tan

Director

KGC (Group of Companies)

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Benchtop Fermenter by BE Marubishi, Japan

B.E. MARUBISHI Japan has a long experience over 50 years in the modern bio - industry. They are specialized in the field of fermentation, food, pharmaceutical, medical, chemical, energy, agriculture and mining. Their products are widely used with high reputation in both government and private institution's laboratories all around the world.



MDFT-μ

Model	MDFT-μ
Description	Micro Fermenter MDFT for 100 ml capacity
Specifications	<ul style="list-style-type: none"> Suitable for minimum volume fermentation The vessel made of Pyrex glass, heat resistance, and autoclavable Silicone made upper head cap Magnet stirrer with DC brushless motor give accurate speed control Air supply with single nozzle sparger, flow meter, and 0.22 μ air filter 6 mm dia. pH and DO electrode can be installed Recorder output for temperature and stirring speed Temperature control by silicone rubber heater and cooling pipe Compact shape console saves space

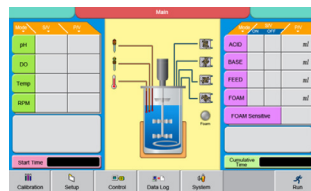


MDFT-500

Model	MDFT-100	MDFT-200	MDFT-300	MDFT-500	MDFT-750	MDFT-1000
Vessel Size	1 Liter	2 Liter	3 Liter	5 Liter	7.5 Liter	10 Liter
Vessel ID	95 mm	114 mm	134 mm	150 mm	170 mm	190 mm
Vessel Depth	158 mm	200 mm	228 mm	285 mm	332 mm	355 mm
Vessel Quality	Heat Resistance Glass Pyrex/SUS316L					
Driving System	Magnetic Bottom Drive/Mechanical Top Drive					
Driving Speed	100 - 1,000 rpm			100 - 800 rpm		
Temp. Range	5°C Above water supply temperature to 50°C					
Aeration Rate	0.2 - 2 sl/min	0.5 - 5 sl/min		1 - 10 sl/min		

BIONEER INTELLIGENT BIOREACTOR SERIES:

- Remote control by PC/Ethernet/Wi-Fi
- Complete calibration for pH, DO electrode, and additive pumps
- Various control items
- Batch control and data logging for substantive bioreactors
- Fed-batch function pH/DO/Load cell/User definition
- Proportional, Upper and Lower limit, PID and Cascade control
- Can be installed any position due to separated component
- Upper drive with a single mechanical seal as standard
- Bottom drive with a magnet coupling is also available
- HMI interface for friendly operation
- Instinctive management and operation
- Fed batch Culture with various ways is available
- Maximum 8 bioreactors can be controlled for batch or Bottom drive with a magnet coupling is also available



Bioneer Intelligent Reactor

Pilot & Industrial Scale Fermenter

All surfaces in product contact are fabricated from SS316 type. All internal and vessel welds are ground smooth & mechanically polished. All interior surfaces are polished to Ra<0.2 micron. Either top entry or bottom entry driving system is available with double mechanical seal.



Fermentation, a process traditionally known for the anaerobic conversion of sugar to carbon dioxide and alcohol by yeast, now refers to an industrial process of manufacturing a wide variety of metabolites and biomaterials by using microorganisms or mammalian cells in a controlled culture environment. Fermentation can be performed in batch mode, continuous mode or in a combinatory, fed-batch mode, depending on the product of interest. Fermentation technology has long been known for the production of various medically important products such as antibiotics, solvents such as ethanol, intermediary compounds

such as citric acid, probiotics such as yoghurt etc. New generation fermentation products include anti-viral drugs, therapeutic recombinant proteins and DNA, and monoclonal antibodies. Apart from the drugs, fermentation is also used for the commercial production of materials required for the development of diagnostic kits, drug delivery vehicles and medical devices. Fermentation technology remains at the heart of rapidly growing biopharmaceutical industry today, which is expected to expand even more in the days ahead, in parallel with the progress in novel, targeted drug discovery.

MSJ Series:

- All surfaces in product contact are fabricated from SS316 material.
- All internal and vessel welds are ground smooth & mechanically polished.
- All interior surfaces are polished to Ra<0.2 micron.
- Either top entry or bottom entry driving system is available with double mechanical seal.
- Versatile use for microbes with standard & plant tissue or mammalian cell with special modification.
- Flexible design suit to the condition of customer's installation site.
- Either modular type controller or multi-channel BIO-Process control (MDIAC-S6) will meet various kind of demand for measurement & control of culture condition.
- Computer coupling with the MDIAC-S6 enable intelligent control system construction.

MPF Series:

- All surfaces in product contact are fabricated from SS316 type.
- All internal and vessel welds are ground smooth & mechanically polished.
- All interior surfaces are polished to Ra<0.2 micron
- Either top entry or bottom entry driving system is available with double mechanical seal.
- Versatile use for microbes with standard & plant tissue or mammalian cell with special modification.
- Flexible design suit to the condition of customer's installation site.
- Bioprocess automatic operation & control system (BPACS) are used to control temperature, pH, agitation speed and other parameters, which for automation control are sterilization, medium transfer, and others.
- A graphic touch panel is used by operator to control system's data display, parameter setting & switching operation.

Glass Chemical Reactor

Equipped with Nickel Based Super Alloy Tube & Flanges
30 Segments PID Temperature Control with Auto-tune Function
High Purity Alumina Fiber Insulation



Model	TOPT-20L	TOPT-30L	TOPT-50L	TOPT-80L
Stir Flange	50	50	50	50
Material Inflow	34# 1L	34# 1L	34# 1L	34# 1L
Condenser	34#	34#	34#	DN40
Multi-function Valve	DN25	DN25	DN25	DN25
Solid Charging Port	\	\	DN80	DN80
Stirring Paddle	16 mm single layer triple blade	16 mm single layer three blade	16 mm double layer three blade	16 mm three layer three blade
Reactor Lid	265 mm	265 mm	265 mm	265 mm
Inner Diameter	290 mm	330 mm	365 mm	410 mm
Reactor Body Height	550 mm	730 mm	850 mm	950 mm
Rotation Speed	50 - 600 rpm	50 - 600 rpm	50 - 600 rpm	50 - 600 rpm

Stainless Steel Chemical Reactor

Fully Stainless Steel for withstand Corrosion in High Pressure Condition

Hand-lifted High Pressure Reactor

- Reactor Lid can rise, has bottom discharge, convenient operating
- Capacity: 1L, 2L, 5L, 10L, 20L, high capacity upon request
- SS304 stainless steel material, withstand up to 300°C

TOPT-TFCF1-10

- Volume: 1L
- Design pressure: <10MPa
- Ambient to 300°C
- Material: SS304
- Agitation Method: Mechanical

TOPT-TFCF2-10

- Volume: 2L
- Design pressure: <10MPa
- Ambient to 300°C
- Material: SS304
- Agitation Method: Mechanical

TOPT-TFCF5-10

- Volume: 5L
- Design pressure: <10MPa
- Ambient to 300°C
- Material: SS304
- Agitation Method: Mechanical

TOPT-TFCF10-10

- Volume: 10L
- Design pressure: <10MPa
- Ambient to 300°C
- Material: SS304
- Agitation Method: Mechanical

TOPT-TFCF20-10

- Volume: 20L
- Design pressure: <10MPa
- Ambient to 300°C
- Material: SS304
- Agitation Method: Mechanical

Nutsche Filter Dryers

- All process can be done continuously in one setup
- The process can be operated under inert gas operation

RFCD-DN600-316L

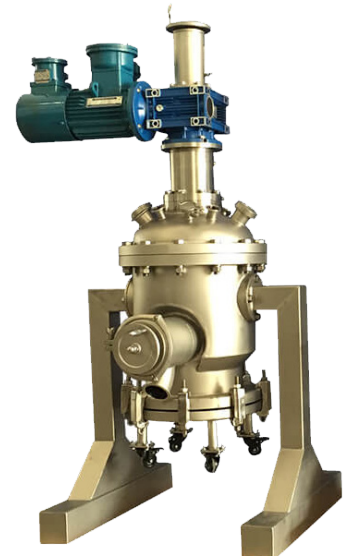
- Tank diameter: 600 mm
- Filter area: 0.28 m²
- Design temperature: 130°C (tank); 150°C (double jacket)
- Tank material: SS316 (contact area); SS304 (double jacket)
- Blade: S-shape asymmetric paddle
- Shaft lift height: 100 mm
- Mixing stroke: 200 mm
- Stirring speed: 0 - 20 rpm
- Stirring lift type: Hydraulic cylinder drive
- Discharge port: 1.5 kW

Scraped Film Evaporator

- New highly effective evaporator
- Low distillation temperature, high distillation vacuum degree
- Short heating time, high separation degree

PWFS-2C

- Material charging: Gear pump
- Flow rate: 30 lph - 260 lph
- Film forming method: scraper
- Material: 316L
- Evaporation sealing: Mechanical seal
- Cold trap: 5m² tube exchanger
- Material pipeline: jacketed insulation
- Shelf & Assembly: SS304 Steel Pipe
- Main evaporation heating: 200°C/38 kW
- Raw material section insulation: 200°C/5.5 kW
- External condenser cooling: Circulation water or industrial chiller



FERMENTERS & REACTORS



Flask Reactor with Heating Bath

Standard configuration: stirring, feeding, reflux condensing, temperature measuring, multi-purpose wide opening and non-liquid accumulation bottom discharge function

Features:

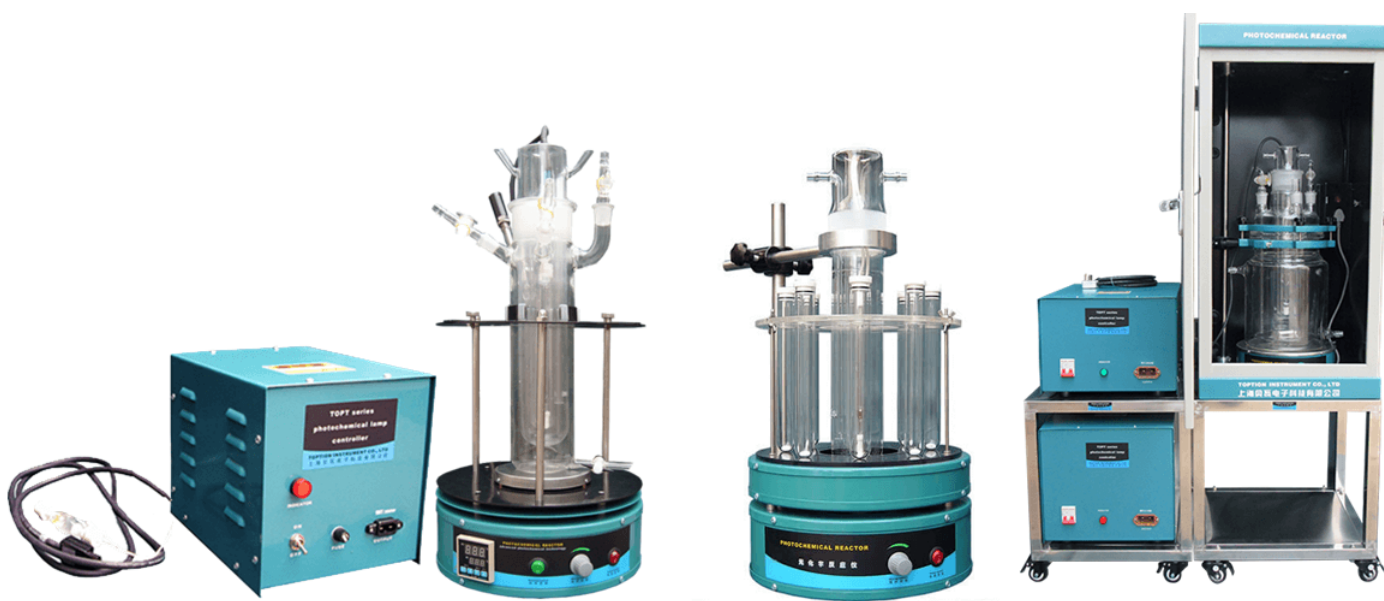
- Adiabatic stand with intelligent heating system inbuilt, two kinds heating method: Oil bath & Heating mantle.
- Max temperature up to 180°C, and digital display. Oil bath can equip cooling coil for reaction material chilling.
- Equips Over-heat & Dry-heat protectors, ensure safe operation of heating bath.
- Heating device material: SS304 stainless steel and spray material are optional.
- Multi-function reaction flask.
- Overall flange connection design, eliminate taper joint seizure which may damage reaction flask.
- Standard configuration: stirring, feeding, reflux condensing, temperature measuring, multi-purpose wide opening and non-liquid accumulation bottom discharge function.
- Extend more function: dripping, bubbling, sample pickup, distilling, rectifying, liquid separation, etc.



Model	TST-2L	TST-5L	TST-10L	TST-20L	TST-30L	TST-50L	TST-80L	TST-100L	TST-150L	TST-200L
Reaction flask(L)	2	5	10	20	30	50	80	100	150	200
Outlet	4	4	5	5	5	6	6	6	7	7
Motor Power	90	120	180	180	250	250	250	250	370	450+
Speed Range	0 - 1,300 rpm	0 - 1,300 rpm	0 - 720 rpm	0 - 720 rpm	0 - 720 rpm	0 - 720 rpm	0 - 720 rpm	0 - 720 rpm	0 - 720 rpm	0 - 720 rpm
Stir bar diameter	φ6	φ10	φ10	φ10	φ12	φ12	φ16	φ16	φ18	φ18
Heater	1,500 W	1,500 W	1.5 kW	3 kW	4.5 kW	6 kW	70 kW	9 kW	10 kW	11 kW
Voltage	220 V	220 V	220 V	220 V	220 V	220 V/ 280 V	220 V/ 280 V	220 V/ 280 V	220 V/ 280 V	220 V/ 280 V
Material	Stainless Steel / Spraying Plastics									
Heating Method	Oil Bath / Heating Mantle									

Photocatalytic Reactor

Complete Photocatalytic Reactor setup with specific wavelength and cooling system to achieve efficiency
Black box can be supplied as protection



TOPT-II

- TOPT-II photochemical reactor is used as liquid phase photochemical reactor.
- Can do research of one sample per once
- Photochemical reactor capacity: 250ml glass reactor (500ml, 1000ml, 2000ml, 3000ml, 5000ml are optional.)
- Opening mouth at the side: air inflow, temperature measure and sample introduction
- Magnetic stirrer with one field
- Mobilized platform: Stainless steel, bottom with wheels
- UV Lamp control system (Xenon lamp, Metal halide lamp control system are optional)
- Protecting box(which can prevent ultraviolet ray)
- Cold pit of quartz(which is used to reduce the heating of lamp)
- Water shortage alarm(it will alarm when the water stop flowing)

TOPT-V

- Suitable for universities and scientific research, small scale research and small capacity photochemical reaction.
- Photochemical reactor capacity: 30ml quartz test reactor(there are 10ml, 50ml, 100ml, 150ml are optional)
- Magnetic stirrer with eight magnetic fields (which can do 8 samples experiment at the same time)
- Working platform: Stainless steel, bottom with wheels
- UV Lamp (xenon lamp, Metal halide lamp are optional)
- UV Lamp control system (Xenon lamp, Metal halide lamp control system are optional)
- Protecting box(which can prevent ultraviolet ray, but have observation window)
- Cold pit of quartz(which is used to reduce the heating of lamp)
- Water shortage alarm(it will alarm when the water stop flowing)

Important Factors in Configuring Photocatalytic Reactor:

- The total irradiated surface area of catalyst per unit volume and light distribution within the reactor.
- The light photon distribution through either direct or diffuse paths within the reactors needs to be decided.
- Direct photon utilization means that the photocatalysts are directly activated with light photon, rather with the assistance of various parabolic light deflectors to transfer the photons.
- To achieve uniformity in photon flux distribution within the reactor, a correct position of light source is essential to ensure maximal and symmetrical light transmission and distribution.
- The photocatalyst particles can be separated by settling tanks or external cross-flow filtration system to enable continuous operation of the slurry reactor.
- A wide variety of substrates have been used for immobilization. These include glass, ceramic membranes, polymers, biodegradable cellulosic materials, optical fibers, and metallic supports, among others. These coated materials are placed within the photocatalytic reactor, on the reactor walls, or even on the lamps, avoiding the separation and recovery stages.
- The photocatalysts will be mixed with water to form a homogeneous or heterogeneous slurry suspension, which will absorb photons from natural solar light or artificial light source, and then react at the solid-liquid-gas interfaces.
- In the design and construction of photoreactors, the geometric set-up of photoreactor, irradiation source (natural or artificial), light source position (immersed or external), catalyst (slurry or immobilized on a support), etc., all should be considered.

Hydrothermal Reactor

After the temperature and the pressure rise, the sample which are difficult to be dissolved under ambient and contains volatile element will be dissolved rapidly

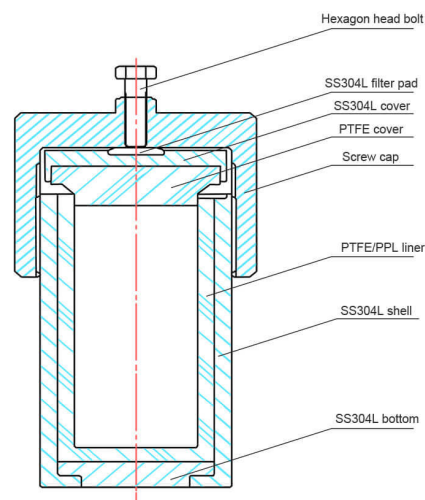


Hydrothermal Synthesis Reactor:

- Material: Various material inclusive of SS304 / SS304, and copper
- Teflon liner can stand up to 220°C / PPL lined 280°C
- Surface pressure less than 3 MPa
- Temperature heating and cooling speed: less than 5°C/min

Model	Material	Capacity ml
TOPT-HT10	Shell: SS304 Liner: PTFE	10
TOPT-HT25	Shell: SS304 Liner: PTFE	25
TOPT-HT50	Shell: SS304 Liner: PTFE	50
TOPT-HT100	Shell: SS304 Liner: PTFE	100
TOPT-HT150	Shell: SS304 Liner: PTFE	150
TOPT-HT200	Shell: SS304 Liner: PTFE	200
TOPT-HT250	Shell: SS304 Liner: PTFE	250
TOPT-HT300	Shell: SS304 Liner: PTFE	300
TOPT-HT400	Shell: SS304 Liner: PTFE	400
TOPT-HT500	Shell: SS304 Liner: PTFE	500
TOPT-HT1000	Shell: SS304 Liner: PTFE	1,000
TOPT-HT1500	Shell: SS304 Liner: PTFE	1,500
TOPT-HT2000	Shell: SS304 Liner: PTFE	2,000

Model	Material	Capacity ml
TOPT-HP10	Shell: SS304 Liner: PPL	10
TOPT-HP25	Shell: SS304 Liner: PPL	25
TOPT-HP50	Shell: SS304 Liner: PPL	50
TOPT-HP100	Shell: SS304 Liner: PPL	100
TOPT-HP150	Shell: SS304 Liner: PPL	150
TOPT-HP200	Shell: SS304 Liner: PPL	200
TOPT-HP250	Shell: SS304 Liner: PPL	250
TOPT-HP300	Shell: SS304 Liner: PPL	300
TOPT-HP400	Shell: SS304 Liner: PPL	400
TOPT-HP500	Shell: SS304 Liner: PPL	500
TOPT-HP1000	Shell: SS304 Liner: PPL	1,000
TOPT-HP1500	Shell: SS304 Liner: PPL	1,500
TOPT-HP2000	Shell: SS304 Liner: PPL	2,000



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LABORATORY WITH OUR**

PRODUCT CATALOG

For South East Asia Inquiries:

KGC RESOURCES SDN BHD (223165-D)
No. 2-2-3, Jalan Setia Prima E
U13/E Setia Alam, Seksyen U13
40170, Shah Alam, Selangor
Malaysia

WhatsApp Us at: **+6014 964 9880**
Call Us at: **+603 3341 2880**
Search Us at: **www.kgcscientific.com**
Email Us at: **sales@kgcscientific.com**
or **info.kgc00@gmail.com**

For Indonesia Inquiries:

PT KGC SAINTIFIK
Jalan Kamal Raya (Kompleks Ruko CBD)
Blok A2-07, Cengkareng Timur
Jakarta Barat 11730
Indonesia

WhatsApp Us at: **+62 899 7255 675**
Call Us at: **+62 212 2522 110/+62 212 2522 114**
Search Us at: **www.kgcscientific.com**
Email Us at: **sales@kgcscientific.com**
or **info.kgc09@gmail.com**