



FORCDYNO

# Deals in High Quality Lab Equipments



## ABOUT US

### Committed to High Quality Service

We are committed to providing high-end industrial solutions that meet all your requirements. We also pride ourselves on delivering exceptional customer support.

What sets FORCDYNO apart from the other players, in the market, is its urge for growth through delivery of excellent products and service to all its customers within quick time.

Thorough research & development, stringent quality control & sophisticated testing procedures & facility is the back-bone of our organization.





FORCDYNO

# Purification Technology System



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## PRODUCTS

### Purification Technology System



**UPSTREAM**



**DOWNSTREAM**



**CURATED  
TECHNOLOGY**



**CHEMISTRY**

## PRODUCTS

### 2 Oligonucleotide Solid-phase Synthesis



#### Lab-scale oligonucleotide synthesis

Bio-Oligo equipment is an efficient, fast and reliable oligonucleotide synthesis equipment, independently developed by Hanbon Sci & Tech Co. Ltd. At present, this series mainly has two types. Bio-Oligo 10 is mainly used for synthesis in the range of 1  $\mu$ mol to 50  $\mu$ mol, while Bio-Oligo 100 can synthesize DNA/RNA within 50  $\mu$ mol to 9 mmol. The equipment adopts modular design and intelligent software. Combined with synthesis columns of different specifications, it can synthesize certain amount of DNA/RNA, this system can be used for clinical research, nucleic acid drug development and synthesis of molecular diagnostic probes.



Figure 3: Laboratory oligonucleotide synthesis



#### Synthesis scale

Item	Synthesis scale
Bio Oligo 10	1 $\mu$ mol-50 $\mu$ mol
Bio Oligo 100	50 $\mu$ mol-9mmol



#### Configuration parameters (Bio-Oligo 100)

Power supply	220V $\pm$ 5% AC	Synthesis scale	50 $\mu$ mol-9mmol
Wattage	900W	Solvent Compatibility	Deprotection reagents, BTT, thio reagents, etc.
Weight	55kg	Column reactor	1
Dimensions	450*570*570mm	Amidite bottle	Standard 8, expandable to 18
Operating temperature	10-40°C	Single cycle time	<30min
Humidity	30%	Synthetic efficiency	>99% for DNA >98% for RNA



#### Pilot-scale oligonucleotide synthesis

Bio Oligo Pro 400 pilot-scale oligonucleotide synthesis is an equipment independently developed by Hanbon . for pilot-scale nucleic acid synthesis. The equipment can be used for synthesis of DNA/RNA in the range of 4mmol to 60mmol. Also, for the synthesis of partially modified DNA/RNA, the recommended synthetic sequence is 20bp~40bp. The equipment adopts explosion-proof design, which can meet the general GMP production requirements. It has a compact design and cover a small area, and can be used for pilot scale-up production to meet the needs of batch production of hundreds of grams. The advent of this equipment has solved the gap in this field of domestic equipment to a certain extent, and alleviated the long-term monopoly of imported equipment in this field.



Figure 4: Pilot-scale oligonucleotide synthesis



## PRODUCTS



### Configuration parameters (Bio Oligo Pro 400)

Infusion Pump	Piston pump, stainless steel, pump head self-cleaning function	Protective gas pressure	Nitrogen/Argon, 0.3-0.35bar
Flow rate range	0-600ml/min	UV detector	Four-channel UV detector, wavelength range 200-800nm, Accuracy±1nm
Synthetic scale	4mmol-60mmol	Conductivity detector	Detection range 1uS/cm-500mS/cm
Single entry quantity	11 (standard configuration)	Dimension	1426x1037x1935 mm (L x W x H)
Number of Column Reactors	1	Power supply pressure	220V±5%AC
Maximum operating pressure	15 bar (218psi)	Power	1500W
		Pipe material	PTFE, PEEK



## PRODUCTS

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### Purification

After the initial sample is ammonolyzed, it will go through a water bath time of about 10 hours, then the product is cooled to room temperature, collected by filtration, rinsed with ultra pure water three times, the filtrate is collected, and the volume is constant to obtain the crude product. Next, the concentration of the crude product and the purity of the crude product are tested to determine the quality of this batch of samples. If the purity of the initial sample meets the requirements, further purification work is generally required to meet the purity requirements for the raw material drug. In the purification process, due to the differences in the purification process paths, there are generally two methods to choose from, reversed-phase chromatography and ion-exchange chromatography, and pharmaceutical companies themselves will choose one or two of them for purification based on their own advantages.



#### Purification - Reverse-Phase Chromatography



#### Laboratory scale HPLC system

The high-performance liquid chromatography system is the equipment that will be used when reversed-phase chromatography is used for purification, and the use of C18 packing material can meet the purification work of laboratory-scale oligo crude products. The high performance liquid chromatography system has also been widely used in the screening of active substances in the research and development of natural medicines, microbial fermentation medicines, peptide medicines, and chemically synthesized medicines. It can prepare milligram-level to gram-level active substances to meet the needs of purification process development.



Figure 5: Laboratory HPLC system



#### Industrial scale preparative liquid chromatography system

In the pilot test and industrial production stages of the purification process, industrial preparative liquid chromatography systems can be used for separation and purification. As an industrialized separation and purification equipment, the CS-Prep industrial preparation liquid chromatography system has the characteristics of high throughput, rapidity, automation, and explosion-proof. It is widely used in the separation and purification of medicine, chemical industry, plant extraction, food and other fields, effectively improving Production efficiency, degree of automation and product purity and yield.

CS-Prep industrial preparation liquid chromatography system consists of infusion part, sample injection part, detection part, fraction collection part, control and data processing part. The overall design of the equipment complies with relevant regulations such as GMP, cGMP and FDA, and can realize processes such as balance, sample loading, washing, elution, automatic collection, and online cleaning, and can provide verification documents that comply with relevant regulations such as GMP.



Figure 6: Industrial preparative liquid chromatography system

## PRODUCTS



### Configuration parameters

Item	CS-Prep 200	Inner diameter of cylinder (mm)	200
Maximum flow rate of infusion pump (L/h)	200	Column length (mm)	680
Column	DAC 150~200	Inner wall roughness (um)	≤0.2
Material	SS316L	Effective filling height (mm)	≤450
Maximum working pressure (bar)	100	Maximum pressure (bar)	≤100
Explosion-proof grade	ExdIIBT4	Packing method	Down Packing



### Purification -Ion Exchange



### Bio-Lab laboratory chromatography system

Bio-Lab™ laboratory chromatography system is an efficient, fast and reliable automatic chromatography equipment independently developed by Hanbon, applied to the rapid purification of bio-molecules such as peptides and nucleic acids etc. from microgram to gram. The system adopts modular design and intelligent software, and can meet the purification needs of various biological macro-molecules in the laboratory with different specifications of chromatography columns.



Figure 7: Oligonucleotide purification instrument



### Configuration parameters

Model	Bio Lab 30	Bio Lab 100	Bio Lab 150	Bio Lab 300
System pump	Binary plunger piston pump, material: PEEK, titanium alloy or 316L stainless steel. It has good biocompatibility, self-flushing function of pump head, preventing pollution and crystallization with electronic pressure pulsation compensation, providing excellent gradient accuracy and repeatability for laboratory chromatography system to ensure the purification reproducibility.			
Flow rate (ml/min)	0~30	0~100	0~150	0~300
System pressure	0~5MPa (Customized)			
Flow rate accuracy	±1%			
Gradient mode	Linear, isocratic, and stepwise elution gradients, gradient ratios can be modified online			



## PRODUCTS



### Bio-Pro® Pilot / Process Chromatography System

In the lab stage, the crude synthesized nucleic acid can be purified by using Bio-Lab nucleic acid purification instrument combined with ion exchange chromatography. Lab chromatography system is more suitable for the purification of crude products from milligram to gram. Subsequent process amplification will need to use pilot scale or industrial scale chromatographic system.

Bio-Pro® automatic chromatography system is suitable for pilot and industrial scale production of biopharmaceutical purification process. The system is designed as integrated module according to ASME BPE and GMP, and can be configured in various ways according to the specific requirements of customers. The system can manually or automatically realize balance, sample loading, washing, elution, automatic collection, online cleaning and other processes, and can provide verification documents meet GMP requirements.

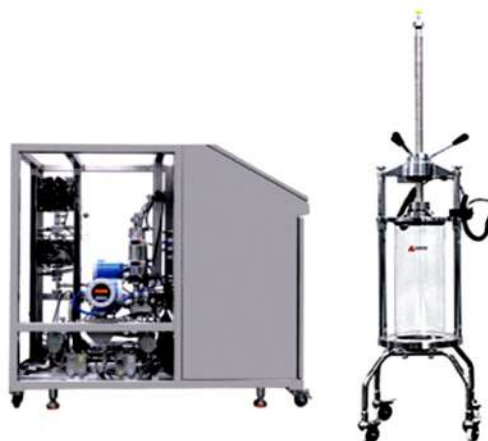


Figure 8: Bio Pro® chromatography system + Manual Chromatography Column



### Configuration parameters

Item	Bio Pro 180	Inner Diameter(mm)	MCC-200
Infusion Pump	Sanitary quaternary diaphragm pump	Column Height (mm)	500/750/950
Flow Range (L/h)	1~180	Operation Method	Manual
Flow Accuracy	1% or 1.5L/h	Pore Size(um)	10/23(PP) or 10/20(SS316L)
Material	SS316L	Cylinder Material	Schott finished glass
System Pressure (bar)	6	Maximum Pressure (bar)	6



## PRODUCTS

### 4 Filtration

#### Laboratory scale automatic tangential flow filtration system

Bio-Lab TFF automatic tangential flow filtration system is an easy-to-use automatic UF/DF system, suitable for the research and development of antibodies, vaccines, nucleic acid drugs, etc. in bio-pharmaceuticals and small-scale harvesting, clarification or concentration, and liquid exchange process and so on. It adopts a fully automatic intelligent design, automatically controls TMP, and can realize functions such as automatic concentration, equal volume filtration, automatic collection, and automatic data recording. There are currently two models available, Bio-Lab TFF 30/60/120/180/850 meets the needs of different membrane materials.



Figure 9: Laboratory scale TFF

#### Configuration parameters

Model	Bio Lab TFF 30	Bio Lab TFF 60	Bio Lab TFF 120	Bio Lab TFF 180	Bio Lab TFF 850
Circulation pump	Peristaltic pump	Diaphragm pump	Diaphragm pump	Diaphragm pump	Diaphragm pump
Circulation pump Flow rate	0-2L/min	0.3-60L/H	0.5-120L/H	0.7-180L/H	50-850L/H
Rehydration pump	Peristaltic pump	Peristaltic pump	Peristaltic pump	Peristaltic pump	Peristaltic pump
Rehydration pump Flow rate	0-2L/min	0-1000ml/min	0-1000ml/min	0-2000ml/min	0-6000ml/min
Maximum pressure of the system	2 bars	6 bars	6 bars	6 bars	6 bars
Filtration membrane area	50cm-0.1m <sup>2</sup>	50cm-0.1m <sup>2</sup>	0.1-0.2m <sup>2</sup>	0.1-0.5m <sup>2</sup>	0.5-2.5m <sup>2</sup>
Circulation tank	Pp material, available in 500ml, 1000ml, 5000ml, and 8000ml sizes				



Figure 10: Industrial scale automatic tangential flow filtration system

#### Industrial scale automatic tangential flow filtration system

Bio-TFF system is an easy-to-use automatic UF/DF system, suitable for the pilot scale and industrial scale production in biomedical industry. Bio-TFF system adopts innovative and intelligent design, which can not only improve process performance, but also achieve extremely low minimum operating volume, maximum ultrafiltration concentration multiple and optimal product recovery function.

According to customer's specific process, Bio-TFF system can be equipped with an intermediate circulation tank from 10 L to 500 L. The circulation tank and the system are separated, which does not affect the operating volume of the system. The system can realize automatic CIP, liquid concentration, equal volume diafiltration, automatic collection and other functions through manual or automatic methods, widely used in the concentration and diafiltration of small nucleic acids, monoclonal antibodies, vaccines, blood products and other biomacromolecules ideal device.

## PRODUCTS

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### Oligonucleotide Synthesis Column



#### Features

1. 316L stainless steel;
2. Specifications 6.3ml, 12ml, 24ml and 48ml are available;
3. Material of synthetic column combines biocompatibility and harsh organic conditions;



#### Specifications of small synthesis column:

Model	Volume	Inner Diameter (ID)	Column Height
SYC 6.3	6.3ml	20mm	20mm
SYC 12	12ml	27mm	21mm
SYC 24	24ml	35mm	25mm
SYC 48	48ml	44mm	32mm



#### Small synthesis column

1. The inner diameter of the cylinder is 35mm, and the volume range is 10ml~100ml;
2. The height of the column bed can be adjusted, which is convenient and flexible. The recommended working height is 3cm~10cm;

Model	Inner Diameter (ID)	Column Height
SYC 35	35mm	150mm



## PRODUCTS



### Features of medium-sized synthesis column:

1. Synthesis column specification ID 60mm, ID 100mm and ID 150mm, the maximum pressure is 2MPa;
2. The synthesis column is equipped with a distributor to ensure that the solution can be evenly distributed on the frit;
3. The synthesis column is resistant to acetonitrile, toluene and a certain concentration of dichloroacetic acid;

Model	Inner Diameter (ID)	Column Height
SYC 60	60mm	100mm
SYC 100	100mm	390mm
SYC 150	150mm	400mm



### Features of production synthesis column:

1. The inner diameter of the cylinder is 600mm, and the maximum pressure is 2MPa;
2. The synthesis column is equipped with a distributor to ensure that the solution can be evenly distributed on the frit;
3. The synthesis column is resistant to acetonitrile, toluene and a certain concentration of dichloroacetic acid;

Model	Inner Diameter (ID)	Height
SYC 600	600mm	1300mm



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## CONTACT DETAILS

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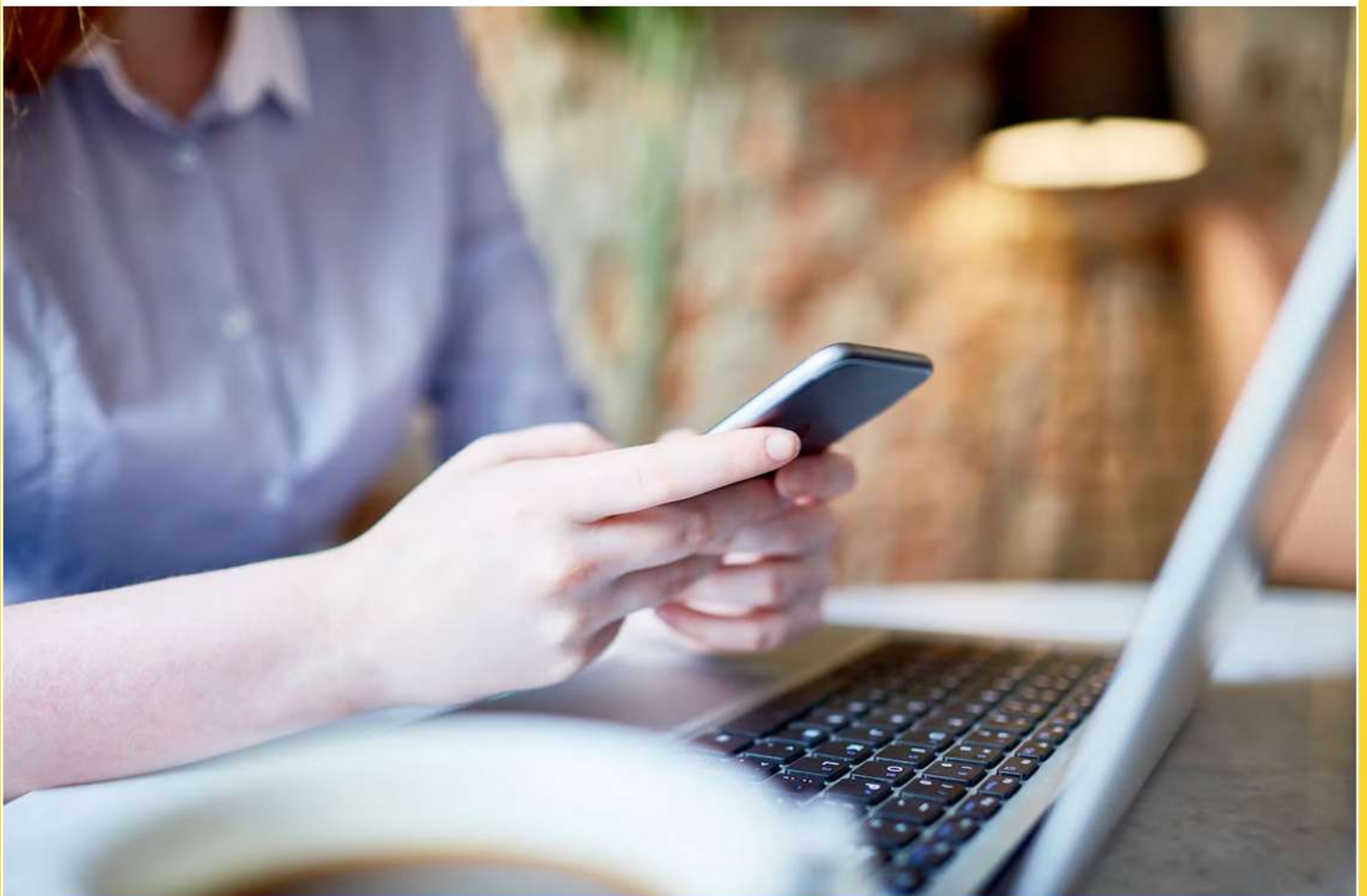
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**THANKS**

*Thank you*