Tofflon



LNP-3000L
oligonucleotide synthesizer

EXPERTISE IN BIO-PHARMACEUTICAL

Tofflon
Life Science Co.,Ltd



Founded in 1993, Tofflon Science and Technology Group Co., Ltd. (SZ:300171) is a comprehensive pharmaceutical equipment and service provider that provides the global pharmaceutical enterprises with overall solutions for pharmaceutical technology, core equipment and system engineering, whose products are applied in injectates, solid preparations, chemical APIs, bioengineering, traditional Chinese medicine, medicine, food and other fields. Tofflon's Life Sciences Co.,Ltd. focuses on the research and development of front-end technologies in the biopharmaceutical and medical industries, and provides the one-stop services integrating equipment system, devices and consumables (including bio-reagents, resin, filters, disposable bags and holder):

- In the field of cell therapy, we provide the overall solutions for the preparation and production of immune cell pipeline, stem cell pipeline, tumor cell vaccines, etc.
- In the field of gene therapy, we provide the overall solutions for the research & development and industrialization of nucleic acid drugs (mRNA/DNA) and viral vector drugs.
- In the field of biological sample bank, we perform the research and development of automatic sample storage management system to provide the overall solutions for cell seed and tissue sample.
- In the field of consumables, we have formed a complete consumable scheme in disposable bags (culture bags/mixing bags/storage bags), bio-reagents (culture media/cryoprotectants/Ficoll/growth factors), resin (GFC,AC,AEX,CEX,HIC,MMC), filtration (microfiltration/deep filtration/TFF/cassette), and hard packagingmaterials.
- In the field of disinfection, we are committed to clean room disinfection, surface and external disinfection, infection control, terminal disinfection and multi-drug resistant microorganism disinfection, providing an overall solution for environmental disinfection.

Relying on Tofflon Group's mature design, manufacturing, engineering construction and after-sales servicecapabilities all around the world, Tofflon Life Sciences Division can serve the biopharmaceutical industry more quickly and professionally.

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LNP-3000L Nanodrug preaparation systems



LNP-3000L oligonucleotide synthesizer is an automated system for large-scale industrial production of lipid nanoparticles (LNP). The system is designed for efficient conversion between products and stable production process, using disposable sterile lines to ensure the sterility of the preparation process; using on-line sensor to ensure the on-line operation monitoring of each parameter during the preparation process. The system enables easy operation and standardized production of gene drug delivery in compliance with cGMP regulations.

Product Features

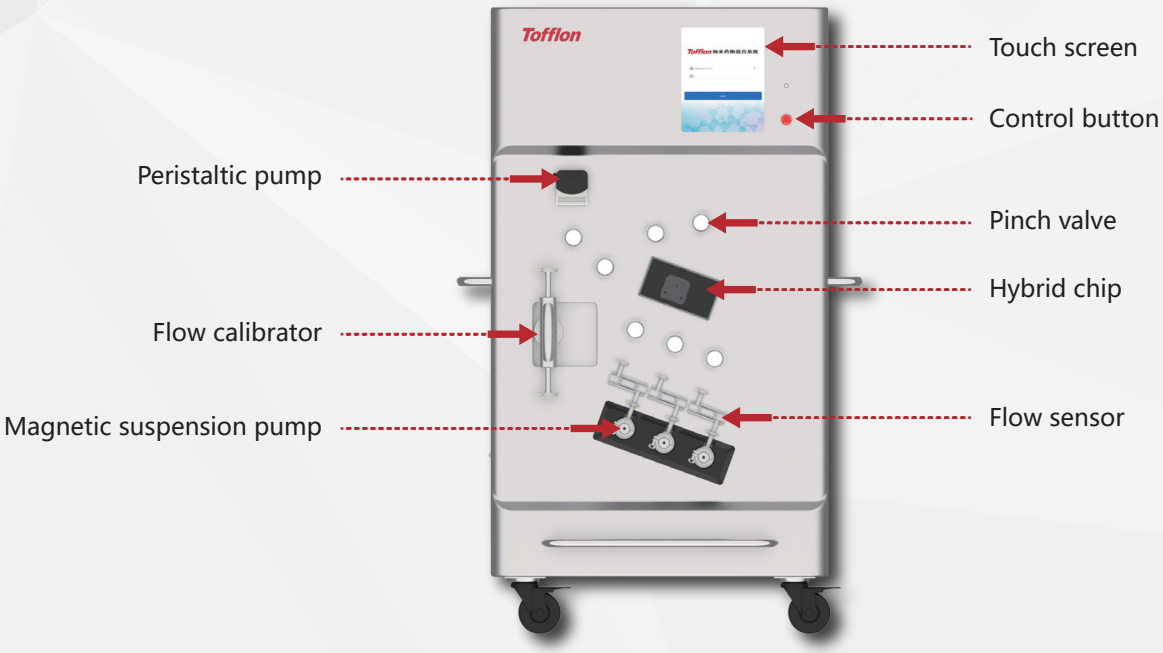
- Microfluidic laminar flow mixing technology is used to provide necessary conditions for large-scale preparation.
- Closed-loop high-precision conveying module ensures the stability of the preparation process.
- By flow calibrator and flow sensor, it could monitor the product preparation process better in real-time to ensure product quality.
- A variety of flow path kits are optional to meet process scale-up requirements from pilot trials to large scale.
- Scientific flow path design, effectively reduce pipeline length and dead volume, and reduce reagent loss.



Product advantages

- High degree of automation -- automatic electronic batch record; Monitor the flow process automatically; Automatic workflow from start-up to calibration, preparation and online dilution, realizing unattended.
- Efficient preparation rate -- closed-loop flow conveying module, tidy process design and core algorithm to achieve efficient preparation efficiency.
- Process reproducibility -- The fourth-generation hybrid chip structure and low pressure, low shear pump enable efficient mixing and constant flow speed, ensuring a robust preparation process.
- Low cross contamination -- disposable flow path kits significantly reduce the risk of cross contamination between batches and production lines; A variety of flow path kits are optional to meet different process requirements.
- Easy to operate -- the front of the machine is equipped with a touch screen, which can operate and control the preparation process, and display the current preparation status in real time, with alarm tips and abnormal handling tips.

Appearance overview



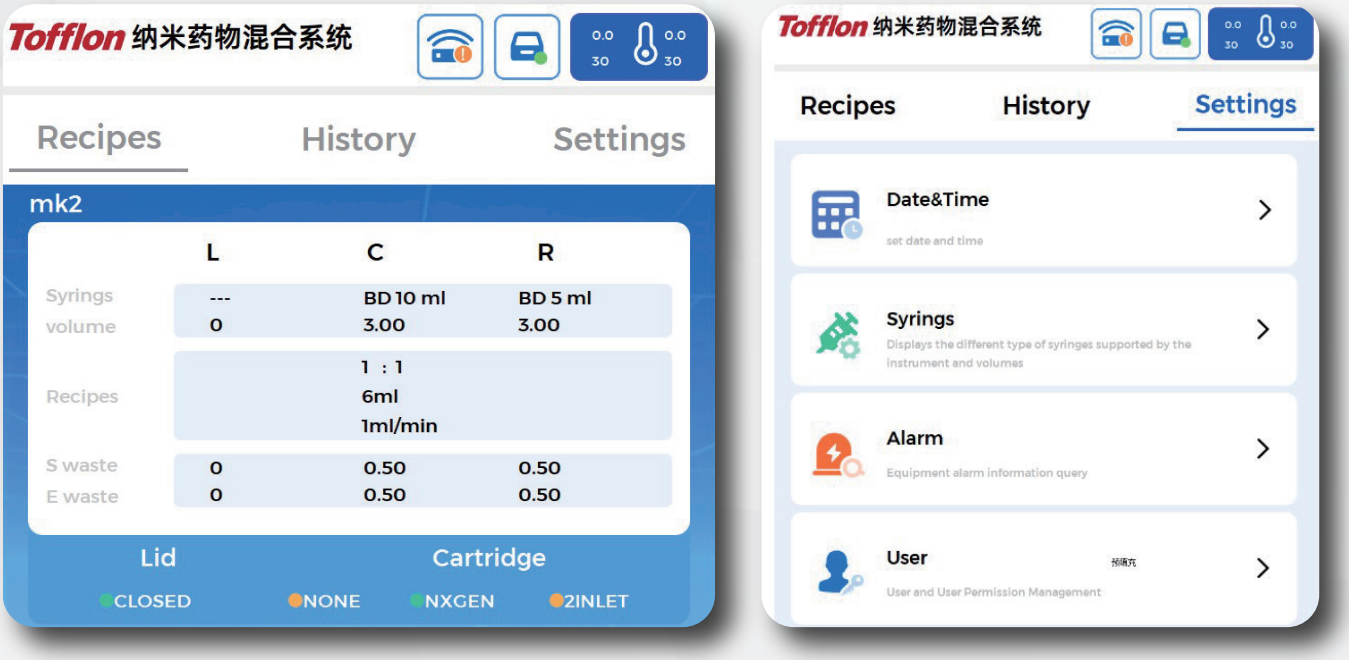
Application

- Biopharma company
- Large-scale drug manufacturers
- Vaccine development and production (mRNA vaccine manufacturers)

Technical parameter of LNP-3000L oligonucleotide synthesizer

Item	Parameter
Processing speed	1000mL/min
PDI	< 0.15
Particle diameter (mRNA)	75nm~100nm
synthetic ratio	> 90%
Mixed mode	Microfluidic laminar flow mixing
Dynamic mode	Magnetic suspension pump
Size/Weight	1000mm(L)*600mm(D)*1650mm(H)； 65kg

Software system



System Main Interface

Function description

- Main interface: Deployment control flow button, display the information of preparation status in real-time.
- Method editing: Set the specific process parameters to generate the method flow that meets the user's expectation.
- Data analysis: Automatically record each preparation data.
- Alarm: Monitoring the preparation process in real time, capturing abnormal data information timely, warn and implement countermeasures.
- Log: Records the entire system operation process and can be viewed by type.
- Multi-level rights: Create roles based on user usage scenarios and assign related rights.

Software feature

- Provides fully automated operation and complete data logging in compliance with FDA 21CFR Part11 regulations.
- Edit, save, execute, import, and export functions for custom method processes.
- Simple page, flexible operation, using the Internet flat UI visual design.

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Nano Drug Preparation System

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Nano Drug Preparation System

LNP can deliver various substances, including pDNA, mRNA, small nucleic acid drugs, polypeptides and proteins, etc. There are many methods for preparing LNP, including liposome extrusion, film hydration, nano-precipitation, microfluidics and microjet mixing, etc. Among them, the commonly used method is to rapidly mix the aqueous phase and lipid phase components through special flow channels. The microfluidic method has excellent repeatability, can achieve nanometer particle size and has a good polydispersion coefficient.

NanoPrep -I, NanoPrep - P, NanoPrep -i nano drug preparation system is designed for lipid nanoparticles LNP, polymer nanoparticles preparation of nano drug delivery technology such as PNP and development design, can under the condition of laboratory, pilot and industrial grade, It can handle packages of different drugs and delivery reagents, and has good scalability.



- NanoPrep-L experimental grade
- NanoPrep-P pilot grade
- NanoPrep-I industrial grade

NanoPrep-L Nano Durg Preparation System (Laboratory Grade)



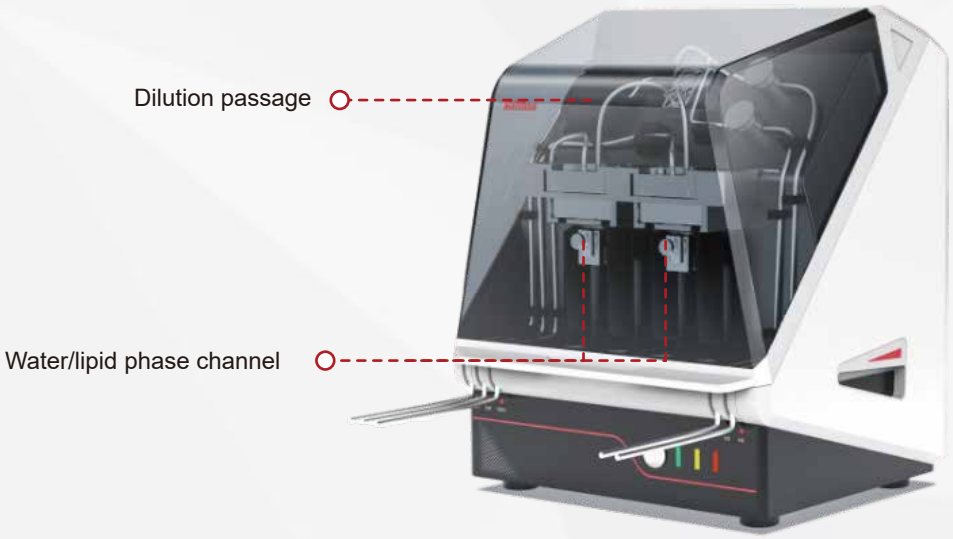
Product feature

- Outstanding product performance: The prepared products feature high delivery efficiency and high transfection efficiency, with a low risk of degradation.
- High production efficiency: Large preparation volume and short preparation time.
- Ergonomic design: Compact and stable structure, with an upward-tilting touch screen for human-computer interaction.
- Complete and unalterable data record: Real-time recording of the experimental process, with traceable and expandable data.
- Comprehensive supporting services: Compatible with mainstream liposome nanoparticle kits, providing relevant process research materials, and possessing a strong technical support and after-sales service system.

Product Application

- Preparation of liposome nanoparticles LNP, lipid polymeric complex LPP, polymer nanoparticles PNP, etc
- The delivery of active apis such as nucleic acids, peptides and proteins, small molecule drugs, and imaging contrast agents
- Laboratory-level gene (nucleic acid) drug development and nanomedicine delivery experiments

NanoPrep-L Nano Durg Preparation System (Laboratory Grade)



Product feature

- Outstanding product performance: The prepared liposome nanoparticles feature high delivery efficiency and high transfection efficiency, with a low risk of degradation.
- High production efficiency: Large preparation volume and short preparation time.
- Complete and unalterable data record: Real-time recording of the experimental process, with traceable and expandable data.
- Scalability: The product can be applied from laboratory to pilot-scale requirements.
- Comprehensive supporting services: Compatible with mainstream liposome nanoparticle kits, providing relevant process research materials, and possessing a strong technical support and after-sales service system.

Product Application

- Preparation of liposome nanoparticles LNP, lipid polymeric complex LPP, polymer nanoparticles PNP, etc
- The delivery of active apis such as nucleic acids, peptides and proteins, small molecule drugs, and imaging contrast agents
- The coverage of nanomedicines from research and development to pilot production

NanoPrep-L Nano Durg Preparation System (Laboratory Grade)



Product feature

- Highly automated: Automatic electronic batch recording; Automatic flow process monitoring; The workflow of automatic preparation and online dilution enables unattended operation.
- High preparation rate: The closed-loop liquid path delivery module, streamlined process design and core algorithm achieve high preparation efficiency.
- Process stability: The combination of microfluidic mixing technology and low-pressure, low-shear force pumps achieves efficient mixing and a constant flow rate, ensuring process stability.
- Low cross-contamination: Disposable flow path kits can significantly reduce the risk of cross-contamination between batches and production lines. The multi-specification flow path kit meets the requirements from pilot-scale to GMP level in different processes.
- Ease of operation: Industrial-grade touch screen display, enabling real-time control of the preparation process.

Product Application

- Biopharmaceutical company
- Large-scale drug manufacturers
- Vaccine research and development and production (mRNA vaccine manufacturing enterprises

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Oligonucleotide Synthesizer

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Oligonucleotide Synthesizer

A fully automatic oligonucleotide synthesizer system platform for targeted synthesis of nucleic acid sequences (including but not limited to conventional oligomeric nucleic acids and oligomeric deoxynucleic acids). This system is based on the solid-phase phosphoimide triester column synthesis method and is used for single-throughput directed synthesis of nucleic acid sequences. The synthesized nucleic acid products are obtained through ammonolysis.

Three different levels of oligonucleotide synthesizers, namely DFL-Oligo L, DFL-Oligo P and DFL-Oligo I, are suitable for use in laboratory, pilot-scale and industrial conditions. The system can select conventional monomers and synthetic reagents, and customize and edit the synthesis process through the platform-based user software to automatically complete the synthesis process. Pilot-scale and industrial-grade products, featuring comprehensive explosion-proof protection, are suitable for the amplification of small nucleic acid synthesis and can achieve convenient and safe standardized production of small noligonucleotide synthesizers.



- DFL-Oligo L Experimental grade



- DFL-Oligo P pilot grade



- DFL-Oligo I industrial grade

Product feature

- High automation: After completing the synthesis preparation, the process can be imported or edited independently on the platform-based user software, and the synthesis can be automatically completed, achieving unattended operation.
- High synthesis efficiency: Under high-quality liquid path devices, streamlined process design and core algorithms, high synthesis efficiency is guaranteed.
- Low loss: Optimized liquid path pipelines, low dead volume of liquid path components, and real-time comprehensive feedback on synthesis efficiency have comprehensively reduced reagent loss.
- Perfect explosion-proof system: Pilot-scale and industrial-grade products are designed with explosion-proof systems in accordance with international standards, effectively meeting explosion-proof requirements.
- Scale coverage: Supports scale coverage from experimental level to pilot-scale level.
- Automatic cleaning: A complete cleaning process thoroughly cleans the remaining monomers and reagents to ensure that there are no hidden dangers in each synthesis. The liquid path has good biochemical compatibility.
- Compliance and data Integrity: Real-time recording of the experimental process, complete preservation of synthetic logs, and traceability and export of data.

Product Application

- All kinds of laboratories (new drug development, etc.
- Compliance gene synthesis service company (customer gene synthesis, primer design, etc.)
- In vitro diagnostic reagent synthesis company (producing probes, positive controls, etc.)
- Vaccine research and development and production (producers of mRNA vaccines and siRNA)
- Exosome delivery manufacturer

DFL-Oligo L Oligonucleotide Synthesizer (Laboratory Grade)





Product Parameter

Item	Parameter
Synthesis scale	10 μmol - 12 mmol
Synthetic efficiency	> 99% for DNA， > 98% for RNA
Cycle time	4.5~25min（DNA）
Pump speed	150ml/min×2
Valve body	8 low dead volume rotary cutting valves
Synthetic condition monitoring	Conductivity meter, UV/ visible light detector, pressure sensor, bubble sensor
Synthetic column	1 to 7
Number of single entries	12
Chemical compatibility	Compatible with commonly used DNA and RNA synthesis reagents, compatible with acetonitrile, dichloromethane, solvent such as toluene, pyridine (except tetrahydrofuran)

DFL-Oligo P Oligonucleotide Synthesizer (Pilot-scale grade)



Product Parameter

Item	Parameter
Synthesis scale	10 μmol - 100 mmol
Synthetic efficiency	> 99% for DNA， > 98% for RNA
Pump speed	3000ml/min×2
Valve body	48 pneumatic diaphragm valves
Synthetic condition monitoring	Conductivity meter, UV/ visible light detector, pressure sensor
Synthetic column	1
Number of single entrances	17
Number of solvent inlets	10
Number of waste liquid outlets	4
Chemical compatibility	Compatible with commonly used reagents for DNA and RNA synthesis, Compatible with acetonitrile, methylene chloride, toluene, Solvents such as pyridine (except tetrahydrofuran)

DFL-Oligo I Oligonucleotide Synthesizer (Industrial grade)



Product Parameter

Item	Parameter
Synthesis scale	100 mmol - 1800 mmol
Synthetic efficiency	> 99% for DNA， > 98% for RNA
Pump speed	18000ml/min×2，96000ml/min×1
Valve body	71 pneumatic diaphragm valves
Synthetic condition monitoring	Conductivity meter, UV/ visible light detector, pressure sensor
Synthetic column	1
Number of single entrances	17/24
Number of solvent inlets	10
Number of waste liquid outlets	4
Chemical compatibility	Compatible with commonly used reagents for DNA and RNA synthesis, Compatible with acetonitrile, methylene chloride, toluene, Solvents such as pyridine (except tetrahydrofuran)

Control software



Function instruction

- Main interface: Deploy control process buttons, displaying real-time synthesis status information
- Method editing: Set specific process parameters to generate a method flow that meets user expectations
- Data analysis: Automatically record each synthesis data, allowing you to view synthesis efficiency and curve peaks, etc
- Alarm: Real-time monitoring of the synthesis process, timely capture of abnormal data information, issue warnings and implement response measures
- Log: It records the entire process of system operations and can be viewed by category
- Multi-level permissions: Customize the creation of roles based on the user's usage scenarios and assign relevant permissions

Software feature

- Can provide fully automatic operation and complete data records, complying with FDA 21CFR Part11 regulatory requirements
- The functions of editing, saving, executing, importing and exporting custom method processes
- The page is simple and the operation is flexible, adopting an Internet flat UI visual design



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