LOGAN
INSTRUMENTS CORP.

TRANSDERMAL DIFFUSION CELL APPLICATION

Innovation

Here at Logan, we are always aiming to meet customers' needs. All of Logan's proud products are designed to make the most efficient use of your laboratory resources from the MDS-600PL Media Delivery System & AVC-100HT Automated Vessel Cleaner to all USP apparatuses and transdermal systems.

Quality

Logan never goes easy on any details. We aim to do our best to achieve the most excellent product quality from design to production and distribution. As a strong competitor in the global market, Logan is committed to bringing you quality products at the highest level attainable.

Service

Logan values customer services and gains feedbacks from those reflections. Our experienced service representatives are dedicated to help clear any problems for our customers. Do not hesitate to inform us if there's anything wrong. We'll do everything and anything to make you satisfied.


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About LOGAN

Logan Instruments Corp. was founded in 1990 in Somerset, New Jersey, USA. Logan is always committed to the design integration of R&D, production, sales and service of automated dissolution systems and automated transdermal diffusion systems. Its products have been used for over three decades by top pharmaceutical companies on five continents. In recent years, Logan has not only developed drug dissolution automation system USP 1-7 method and dissolution methodology, but also developed artificial skin for transdermal absorption experiments. Now Logan has grown into a worldwide leader in the design, manufacture and distribution of products for dissolution, diffusion and physical testing of pharmaceutical dosage forms.

The products developed by Logan Instruments Corp. conform to USP specifications/standards and they are all FDA 21 CFR Part 11 compliance. Logan has always been focused on designing top-quality products and staying committed to the needs of enterprises.

Dr. Luke Lee

President / CEO
Mechanical Engineer
Industrial Designer
Major in System Automation

HISTORY OF THE TRANSDERMAL SYSTEM

1965

Stoughton introduced the idea of transdermal drug absorption.

1979

The first Scopolamine transdermal patch used to treat nausea and vomiting due to Vertigo had conformed to FDA requirements.

1990

Logan began to design and produce Franz Cell and Drive Consoles for Crown Glass.

1995

Logan officially entered transdermal diffusion field and introduced the first vertical transdermal diffusion system FDC-6.

1996

Logan introduced side by side diffusion cells and cornea cells for eye drop absorption through cornea study.

2001

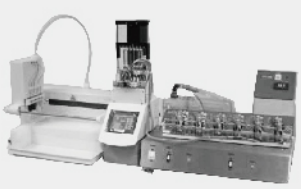
Logan introduced dry heat transdermal diffusion system DHC-6.

2007

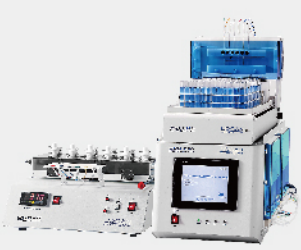
Logan introduced second generation of vertical transdermal diffusion system FDC-6T using patented design Bubble Free Cell.

2012

Logan introduced first generation automated dry heat transdermal system 912 which first performed - group of four design, automated sampling among 24 transdermal diffusion cells. The automated water jacket transdermal system 913 was introduced in the same year.



2014



Logan introduced second generation of dry heat transdermal diffusion cell DHC-6T and automated dry heat transdermal system 914.

2017

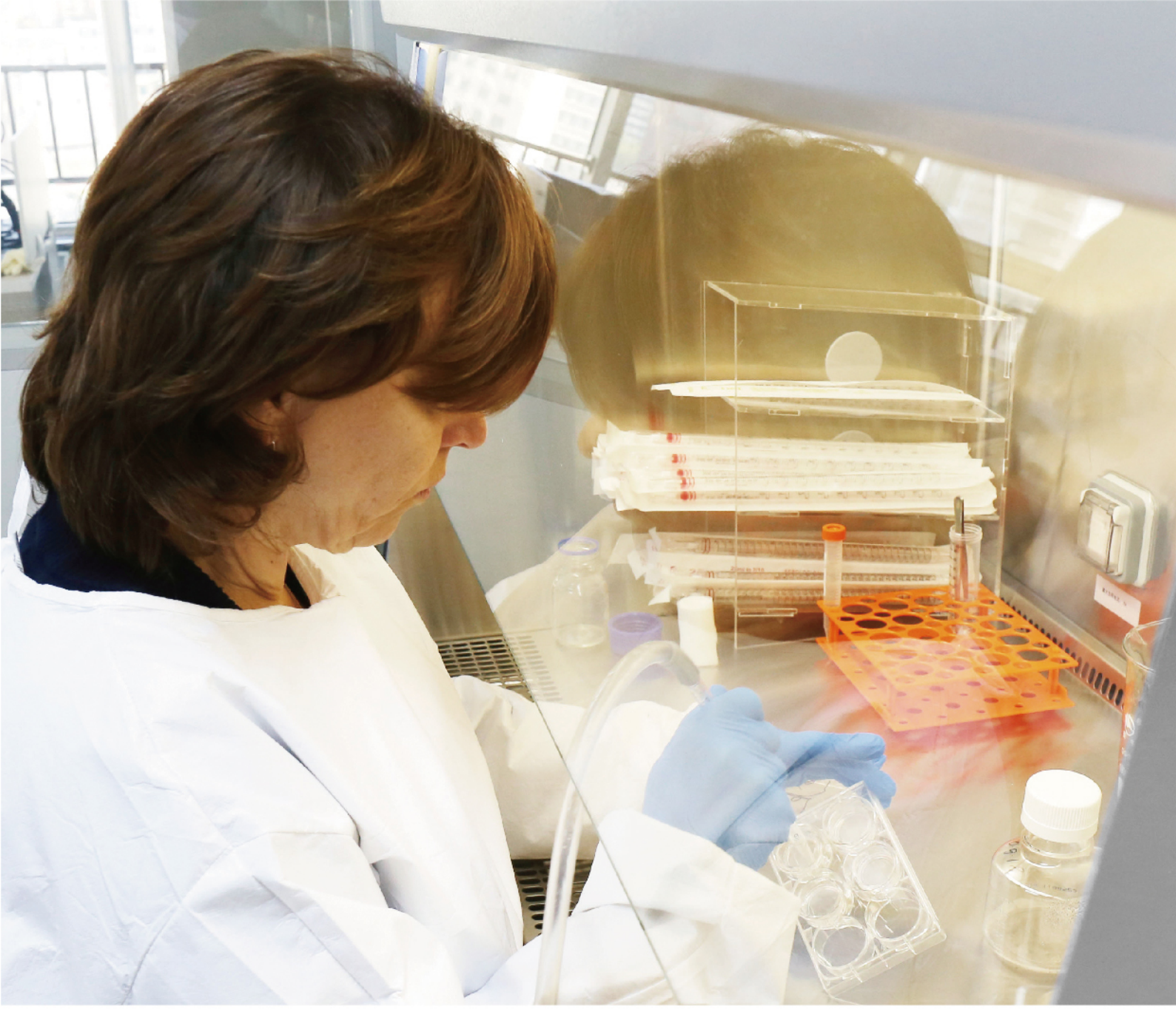
Logan introduced first generation vertical transdermal diffusion cell system FDC–6TA as an upgrade to FDC-6T.

2018

Logan introduced new generation of dry heat transdermal diffusion cell system DHC-6TD, in the same year, they introduced newest generation of automated dry heat transdermal system 918.

2019

Logan introduced robotic transdermal system DRAGON 12.



PHARMACY

Pharmaceutical field

Transdermal delivery system performs a new type of drug application, that is, through skin. It can help avoid liver damage and discomfort GI tract, it can also maintain a stable, and controllable, blood concentration. It is most suitable for elder patients, children, and patients with oral difficulty. However, transdermal patches usually have small dosages due to limited permeation speed.

Requirements

USP 38 Part 1724 specifies the quality of diffusion cells for semi-solid drug formulation and specific measurements.

CHEMICALS/COSMETICS

Chemicals/Cosmetics

With the increasing engagement of chemical/cosmetics products in people' s lives nowadays, potential safety concern has gained more attention than ever. Transdermal diffusion system can testify drug diffusion status and ensure safety.

Requirements

OECD mentioned using in-vitro transdermal diffusion system to testify drug absorption through skin in the "OECD Guideline for the Testing of Chemicals" in 2004.

CONTENTS

TRANSDERMAL DIFFUSION CELL SYSTEMS

It is used for testing permeation of semi-solid dosage, topical drug formulations, transdermal patches as well as for cosmetic products, such as gel, cream, face masks, lotion, sunscreen, etc.

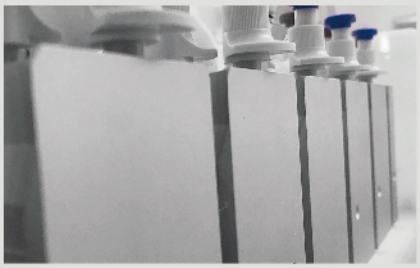
Transdermal diffusion cell systems

Transdermal diffusion cell systems are for mimicking drug absorption process through skin and provide automated transdermal diffusion and permeation process.
Different transdermal diffusion cell systems are needed to test different transdermal drug formulations. Logan provides vertical cells, horizontal cells (side by side) transdermal diffusion systems.

Model	Features
DHC-6 series	Dry heat bubble free diffusion cells/ Color touchscreen display / Individual temperature sensor / manual sampling / Tilting system / Optional surface temperature display
FDC-6 series	Water jacket bubble free diffusion cells / manual sampling / Tilting system/ Expandable to 2 or 3 speed zones
SDC-6	Water jacket horizontal (side by side) transdermal diffusion cells/ manual sampling / two-zone-system with 3 positions per zone
SFDC-6	Water jacket vertical / horizontal (side by side) transdermal diffusion cells / manual sampling /two-zone-system with 3 positions per zone

DHC-6 Dry heat transdermal diffusion cell system

DHC – 6 series dry heat diffusion cell systems are for testing drug permeation rate.



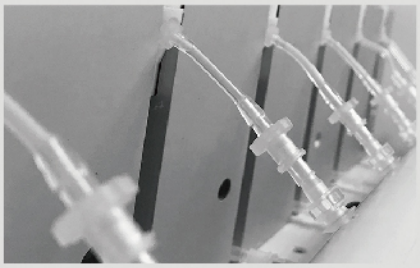
Temperature control heater block

ensure even cell temperature

Real time receptor temperature display

Optional membrane surface temperature display

User-friendly interface on color touchscreen display

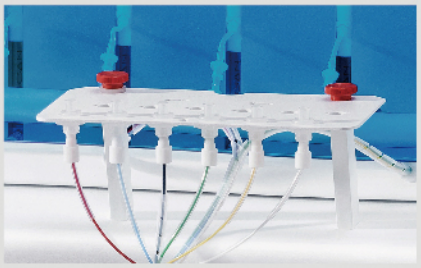


Patented bubble free cells automatically purge bubbles

ensure complete contact skin surface and receptor fluid

Translucid cover

for light sensitive products and dust protection

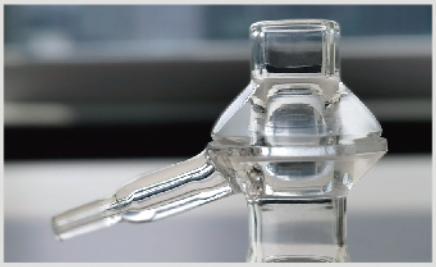


Sampling

Partial sampling / full sampling and media replacement

FDC-6 series vertical transdermal diffusion cell (Franz Cell)

FDC-6 series is made of Franz cell to test drug permeation rate.

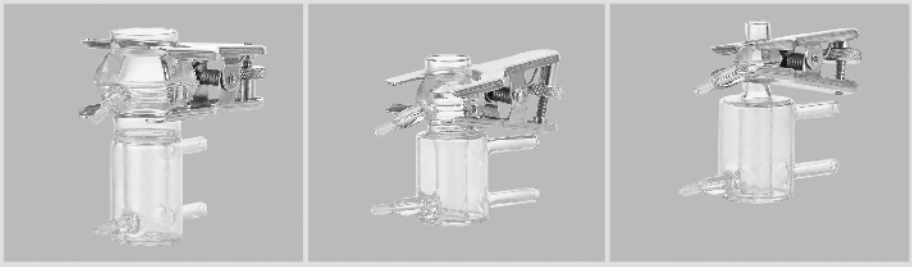


Patented bubble free diffusion cell design

Bubble-free system purge out all bubbles under the membrane

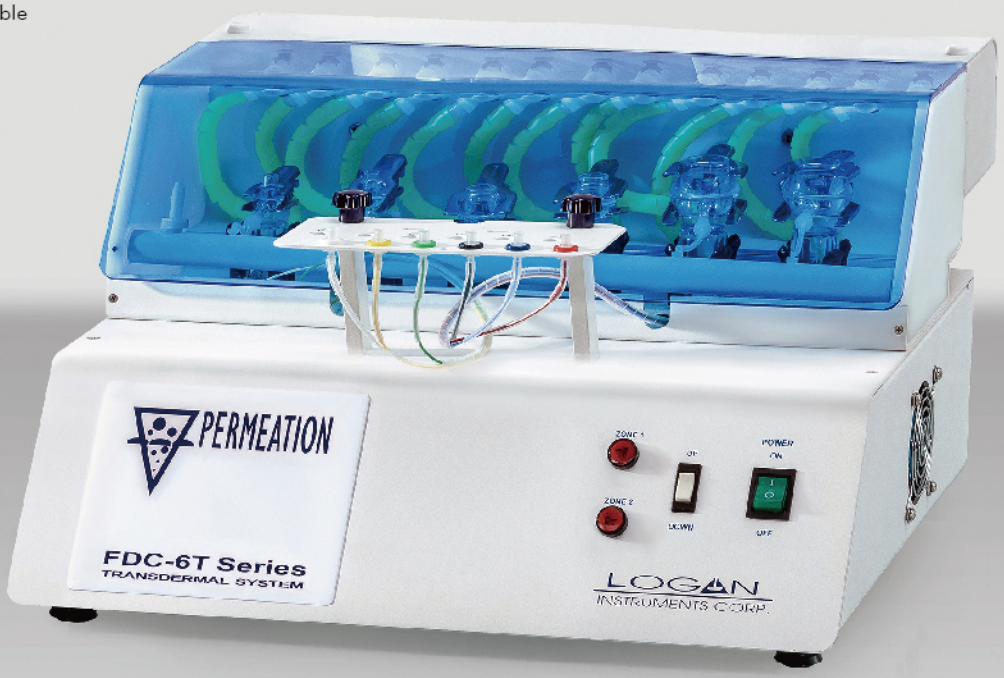
Partial/full sampling

Updated Franz cell design can perform partial or full sampling



Transdermal diffusion cell

Various sizes available



SDC-6 horizontal transdermal diffusion cell system

SDC-6 horizontal diffusion cell system is made of water jacket side by side cells to testify solution permeation ability.

- Side by side cells
- Water jacket temperature control system
- Various sizes of Diffusion cells
- Used for testing drug solution permeation
- Used for drug permeation/absorption tests

SFDC-6 vertical/horizontal transdermal diffusion system

SFDC-6 vertical/horizontal transdermal diffusion cell system used 3 horizontal diffusion cells and 3 vertical diffusion cells to test permeation rate of drugs.

- Compatible with 3 vertical diffusion cells and 3 horizontal diffusion cells
- Water jacket temperature control system
- Various sizes of diffusion cells
- Used for testing permeation rate of drug solutions and semi-solid drug formulation

AUTOMATED TRANSDERMAL DIFFUSION CELL SYSTEMS

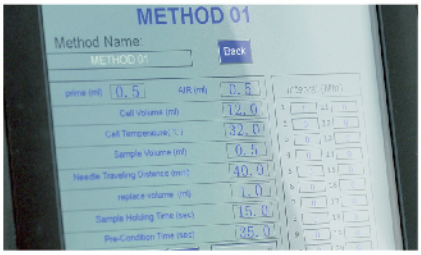
Used for testing permeation rate for semi-solid drug formulation, topical drug formulation, as well as cosmetic products such as gel, transdermal patches, face masks, lotion, sunscreen etc.

Automated transdermal diffusion cell systems

Automated transdermal diffusion system is made with updated technology. It contains DSC-800 system controller, SCR-DL sample collector and a transdermal diffusion system. It can be used for testing permeation rate of semi-solid dosage and topical drug formulation, as well as cosmetics products such as gel, cream, transdermal patches, face masks, lotion, sunscreen etc.

The system supports data audit tracking, and electric signature. It complies to FDA 21 CFR Part 11 and GMP/GLP requirements.

Model	Features		
913 series	Water jacket heating system	compatible with FDC – 6TA	compatible with 4 transdermal diffusion systems, automated sampling, partial/full sampling
914 series	Dry heat	compatible with DHC – 6T	
918 series	Dry heat	compatible with DHC – 6TD	

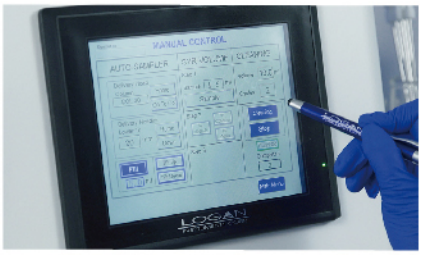


Cell/waste sampling mode

"Cell Mode" is for partial sampling, it cleans tubing and performs media replacement after sampling. "Waste Mode" is for collecting all samples in the cell. It cleans tubing and performs media replacement after sampling.

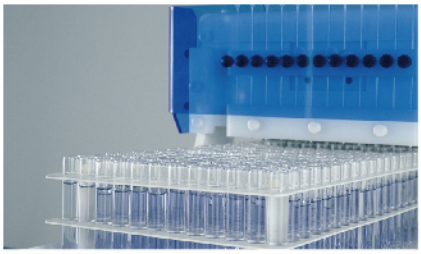
High accuracy sampling

Sampling accuracy: ±0.1ml



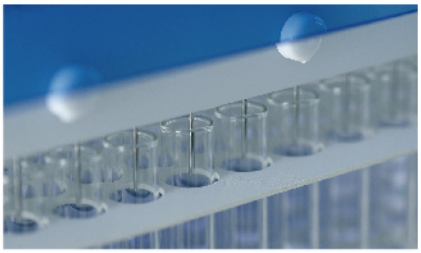
Automatic cleaning

Tubing self-cleaning procedure after experiments



Sample collector

240-position testing tubes and HPLC vials



Multi point sampling

Automated sampling various time intervals

Patented bubble free diffusion cell design

Ensure complete contact skin surface and receptor fluid

Color touchscreen operation

User friendly interface

913 series
Automated water jacket heating transdermal system

- Water jacket heating
- Compatible with FDC-6TA
- Can work together with 4 transdermal diffusers
- Automated sampling and automated sample collecting
- Partial/integral sampling

914 series
Dry heating automated transdermal system

- Dry heating mode
- Compatible with DHC-6T
- Can work together with 4 transdermal diffusers
- Automated sampling and automated sample collecting
- Partial/integral sampling

918 series
Dry heating automated transdermal system

- Dry heat mode
- Compatible with DHC-6TD
- Can work together with 4 transdermal diffusers
- Automated sampling and automated sample collecting
- Partial/full sampling

Dragon 12

Transdermal robot is made with updated technology, it contains transdermal diffusion system, system controller and sample collector. It is used for testing permeation rate for semi-solid dosage and topical drug formulation for minimal sampling volume. It can also be used to test cosmetic products, such as gel, cream, transdermal patches, face masks, lotion, sunscreen, etc.

It supports data audit tracking and electronic signature feature, and it complies with FDA 21 CFR Part 11 and GMP/GLP regulations.

Features

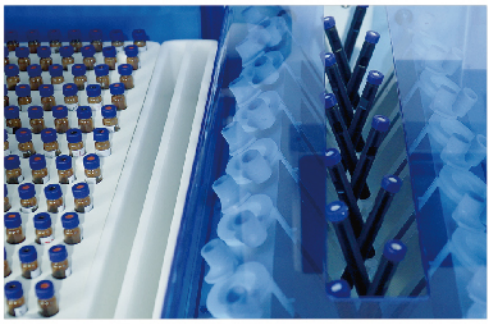
Different test methods available based on different requirements

Media replacement

Automated media replacement

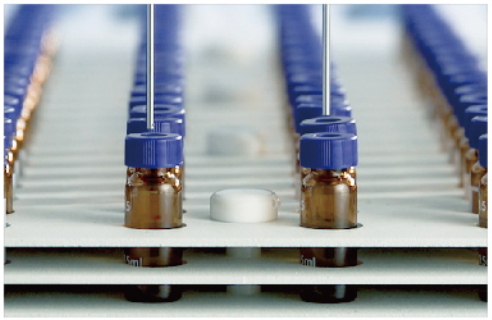
Dosage volume control

Ensure persistent drug volume



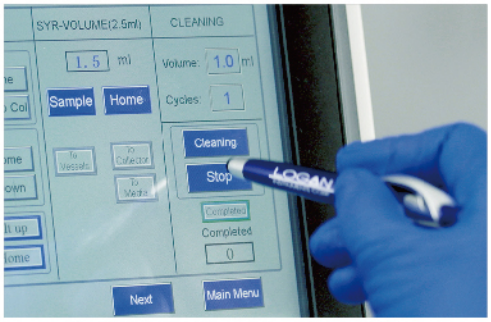
Partial/full volume sampling

Partial/full sampling available when work with minimal volume syringe pumps



Sample collecting

240-position sample collecting vials



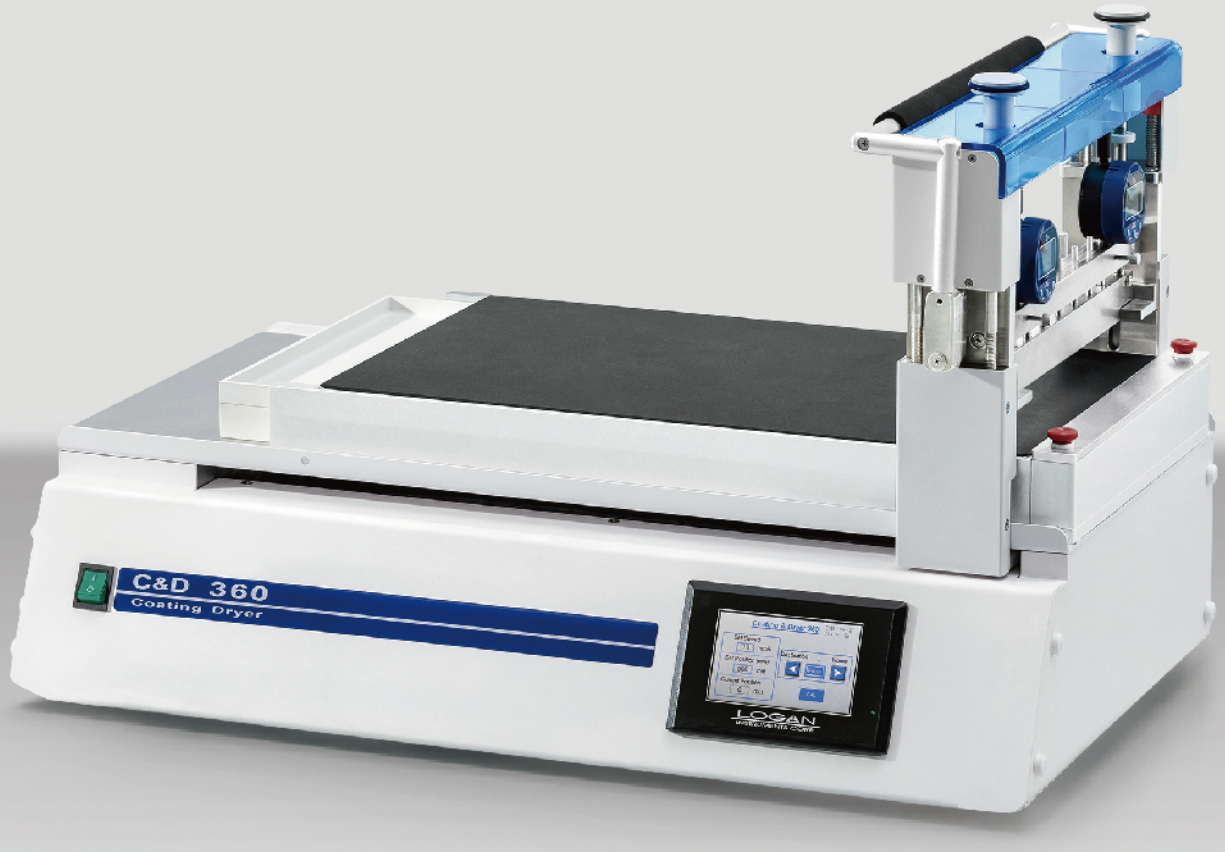
Automated cleaning

Automated tubing cleaning procedure after test is over

Coating & Drying machine

C&D 360 patch coating and drying system evenly apply a patch ingredient and release liner by using a dual-peak-blade. It can be used on transdermal patches.

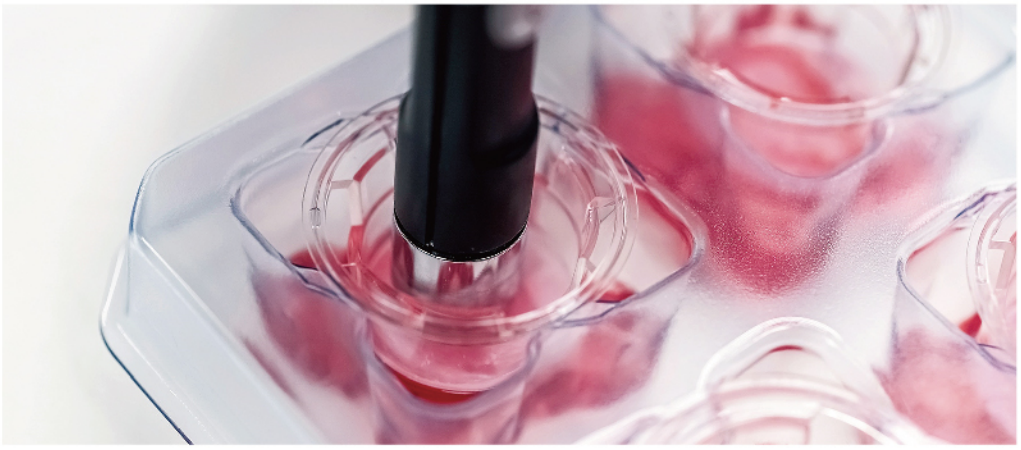
- High stability, even coating
- Built-in waste tray to eliminate waste
- Detachable blade provides flexible operation and easy cleaning
- Built-in leveler setting
- Supports multi-language, user-friendly color touchscreen display
- Selectable models for manual or auto thickness control
- Dual-peak-blade design for even coating
- Optional heating device to dry patches



Consumable

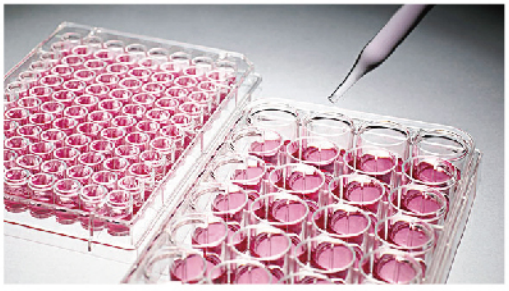
In-vitro animal skins are usually used to substitute human skin in transdermal diffusion experiments. Nowadays, artificial skin is being used more to substitute human skin due to the fact that artificial skin has similar bioactivity as human skin and provides good repeatability.

Logan Instrument Corp. provides many kinds of experiment material including in-vitro animal skin, artificial skin, permeaskin, etc.



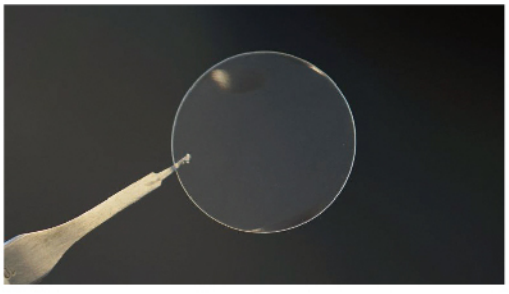
Artificial skin

Logan artificial skin has combined cytobiology and tissue engineering technology, becoming a qualified substitution of human skin. It can be used for skin permeation study, skin corrosion study, skin insulation study, transdermal drug absorption study, skin phototoxicity study and skin genotoxicity study.



Permeaskin

Logan's very own permeaskin contains multiple layers of cellulose, it can be used for simulating drug absorption on/through skin.

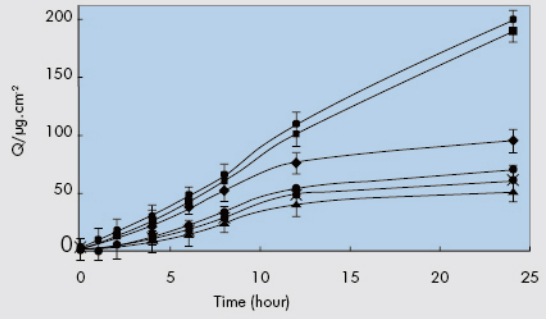


Application

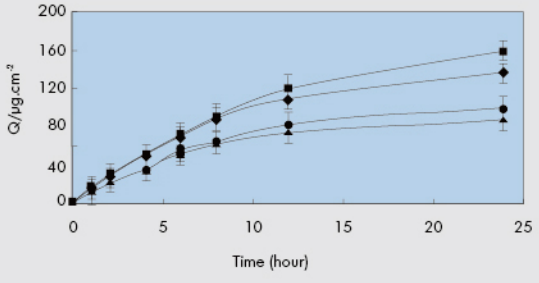
Development of Losulofenac transdermal patch

Losulofenac is an anti-inflammatory analgesic, invented by Business Guide-Sha in Japan, is used for treating rheumatoid arthritis, osteoarthritis, lumbar pains, scapulohumeral periarthritis, neck-shoulder-syndrome, odontalgia, and pain and fever triggered by operations, injuries, and acute upper respiratory infection. As of now, most Losulofenac is to be taken orally, however, oral dosage causes gastrointestinal irritation. Japan first ratified the Losulofenac patch in the market, which had great permeation effect through skin.

Different permeation pharmacokinetics effect on transdermal diffusion



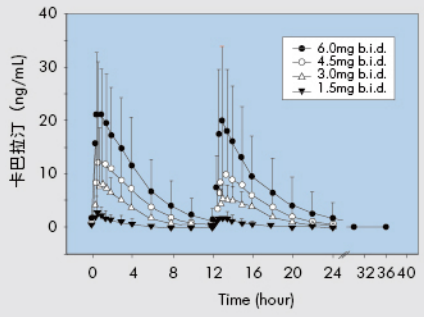
Different receptor fluid's effect on transdermal diffusion



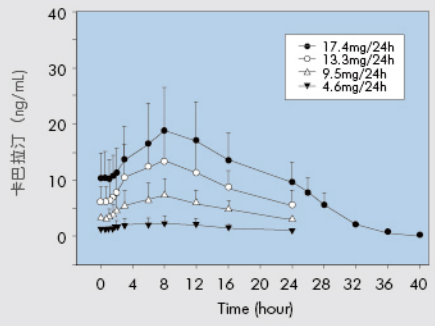
Performance Study of Rivastigmine (RVS) Transdermal Patch

RVS is an anticholinesterase and is for treating Alzheimer's disease (AD). RVS transdermal patch from Novartis is the very first patches to cure AD and it has come into the market of America, Japan and EU in recent years. Patients are expected to use one patch per day. The instruction is easy to follow, drug release is steady and even to ensure blood concentration. The patch also avoids GI absorption, which decreases the side effects of Cholinesterase inhibitors.

Oral dosage versus blood concentration distribution
(1 capsule 2times/day)

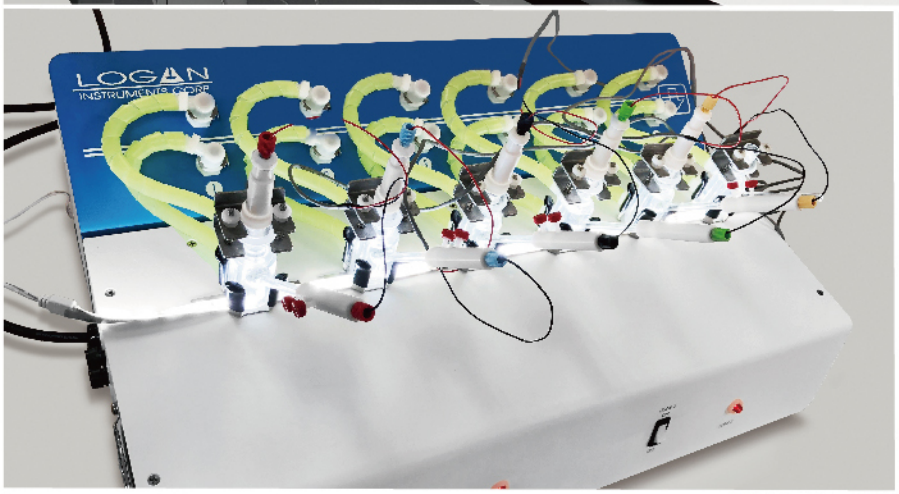


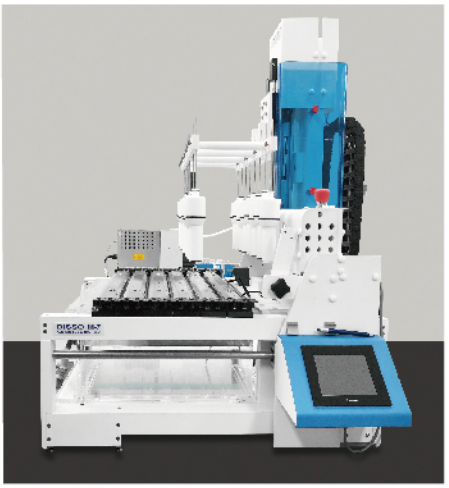
Transdermal patches versus blood concentration distribution
(RVS concentration 24 hours after application)

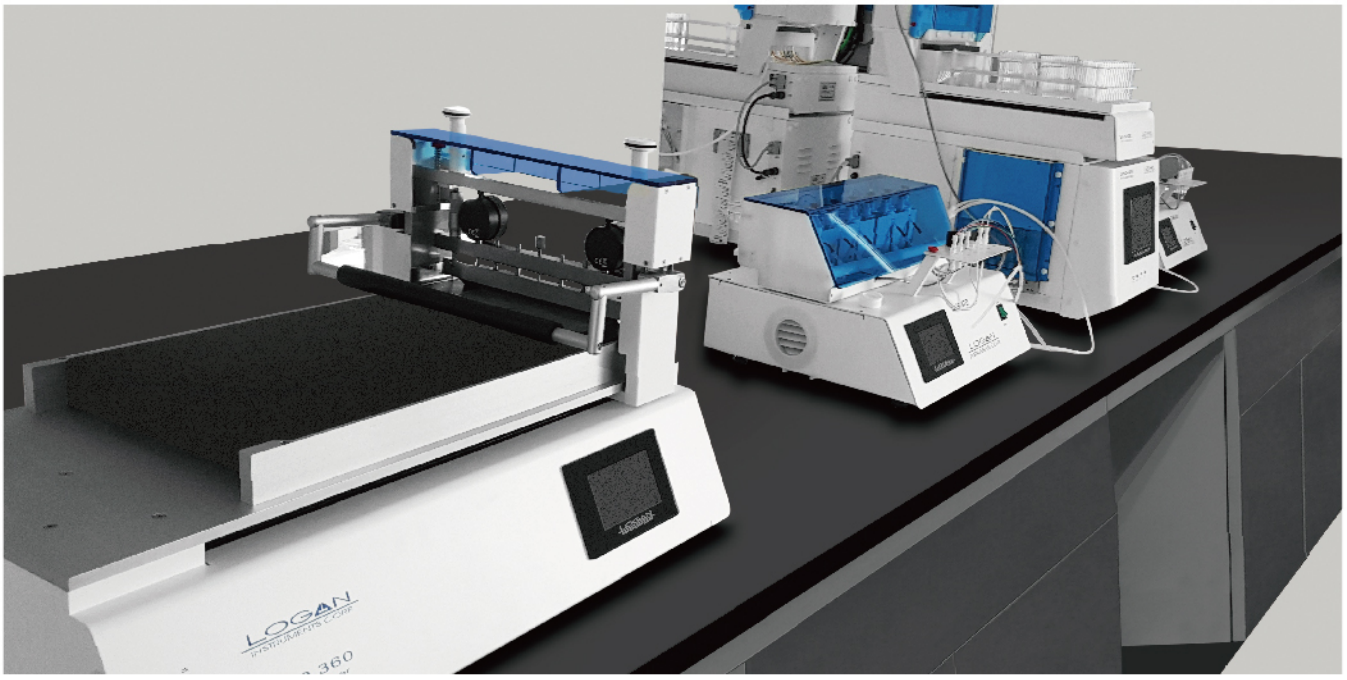


Application perspective

Logan Instrument Corp.'s transdermal patches have been trusted and used by various brands across the globe. We provide full service to those in needs.







Brand culture

Globalization

Logan was founded in New Jersey, USA in 1990. It has a number of production, research & development and design organizations all over the world, which are subject to consistent quality requirements to ensure that each global customer enjoys high-quality products and services under ISO 9001 quality management system.

Specialization

Logan has always been committed to the integration of research & development, design, production, sales and service of tablet dissolution, transdermal diffusion cell release, permeation & absorption and other systems. At present, Logan has obtained a number of patented technologies and software rights, and its products have been used by many pharmaceutical companies worldwide for over 30 years.

Quality-oriented

All products provided by LOGAN are subject to strict quality control. We pay attention to every detail. Logan team pursues quality in every link from design, production to sales with unremitting efforts.

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