

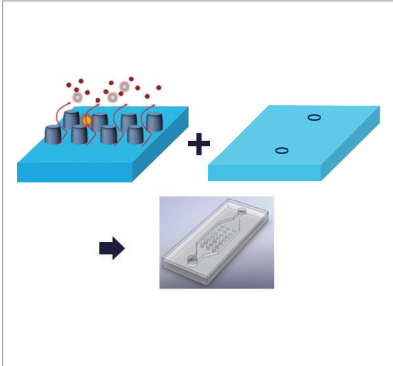
# Micro-channel Device Manufacturing Technology

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- ⇒ Design and processing technology for packaging, one of the core technologies for manufacturing of plastic microchannel device using microchannel with a size ranging from dozen nanos to several hundred micros, that seals microchannel to prevent leaking of liquid sample and minimizes deformation of the channel.
- ⇒ Irreversible packaging technology including plastic plate welding and adhesion and reversible packaging technology allowing sealing and unsealing repeatedly.

### Client / Market

- Diagnostic device, medical device companies



### Necessity of this Technology

- Conventional adhesion or welding packaging technology for plastic material has difficulty in sealing and maintaining precisely nano/microchannels on the surface due to heat, pressure, or chemical solvent used during the process that affect the surface structures and properties.
- Due to the high temperature and chemicals during the packaging process that may cause damage in various biochemical substance including protein, it can be used only for very limited applications.
- When irreversible packaging is done with adhesion and welding, unsealing and resealing is difficult in the middle of using the microchannel device or pre/post-process for using the device when it is needed.
- Packaging done with mechanical clamping, the microchannels are hard to be sealed uniformly, which results in leakage from some of channels frequently.
- It is necessary to apply the optimal packaging design and process technology that considers the shape and size of the microchannel depending on the purpose, requirement, and use environment of the microchannel.

### Technical Differentiation

- Capable of various irreversible packaging process technologies such as ultrasonic welding, thermal or adhesive bonding that prevents leaking and minimizes deformation of the microchannel on a plastic plate.
- Capable of reversible packaging process technology, heating-free and chemical-free, that can seal the microchannel hermetically and maintain the microchannel shape and size precisely.

### DESIRED PARTNERSHIP

Technology Transfer

Licensing

Joint Research

Other



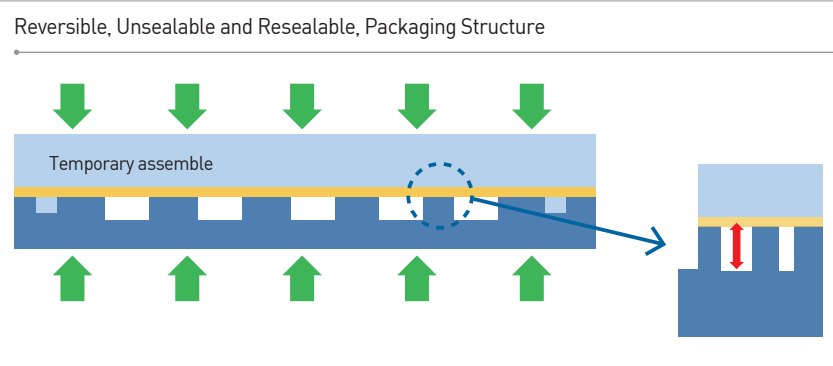
### TECHNOLOGY READINESS LEVEL [TRL]



- With the reversible packaging process technology, the device can be unsealed or resealed repeatedly while the device is in use or in pre- or post-process, which makes the device be applied to more diversely.

### Excellence of Technology

- Reversible packaging technology, prevents negative effect on biochemical substances like protein and cell due to its heating-free and chemical solvent-free process, which is a great benefit regarding development of bio devices.
- As a mass producible packaging technology using plastic material, productivity that is equivalent to that of injection molding can be realized-over 90% yield and processing time of 1 minute or less.
- Based on this reversible packaging technology, the lead time for a device can be reduced to from few days to a month, which enables rapid development.



### Current Intellectual Property Right Status

#### PATENT

- Fabrication of Plastic Bio-chip Employing Microchannels (KR1392426, PCT/KR2014/005141)
- Local Pressurization Typed Microchannel (KR2017-0184209)
- Microchannel with Joints (KR2017-0184201)
- Microchannel (KR2016-0079890)

#### KNOW-HOW

- Microchannel ultrasonic welding process
- Microchannel film adhesion packaging process
- Thermal and chemical welding for microchannel