

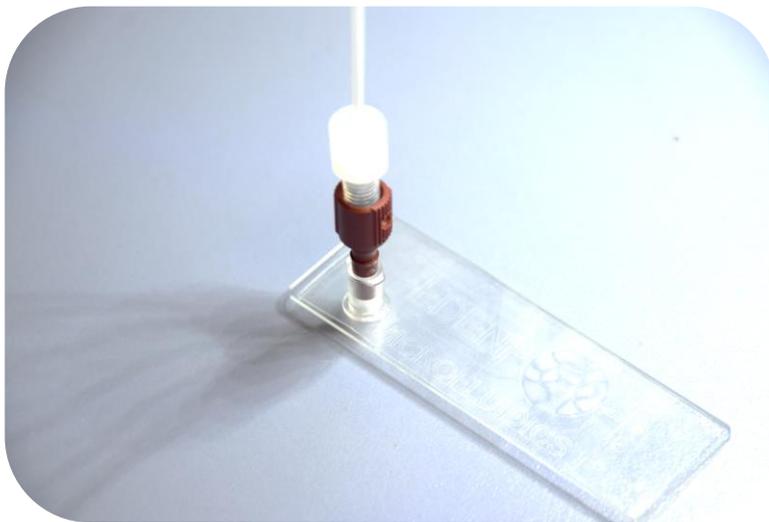


Eden Materials

Application Note: Flexdym™ Chip Connectors

Chip-to-World Connection For Flexdym™ Microfluidic Devices

Issue Date: 18/04/2020



Eden Tech

Registered office: 83 Avenue Philippe Auguste, Paris 75011, France

Registration / SIRET: 83325407100016

1 Summary

This application note describes the chip-to-world connection of microfluidics chips produced entirely or partly of Flexdym™, a proprietary polymer developed by Eden Tech. Flexdym™ is a novel material developed for easy and fast microfluidic microfabrication, harboring key advantages for biological applications. It provides a new option to innovators who may feel restricted in their material choices and frustrated by lengthy prototyping protocols. It allows faster production of devices at a small scale and the opportunity to mass produce devices.

Historically, PDMS is the most used material for prototyping in microfluidics biological applications. These devices have a thickness in the cm range, enabling connection to equipment, such as pumps and reservoirs, by inserting the tubing directly into inlet and outlet holes punched into the device (plug-&-play). While straight forward, this method often leads to inlet/outlet leakage of air and fluids, when fluidic pressure is applied to the device, or cracks that are created in the chip when the tubing is inserted.

In contrast, Flexdym™ devices use thinner layers of material, which are recyclable and save costs. These can be bought as commercially available sheets at a thickness of 2 mm or lower, or as pellets to be molded to the clients desired thickness. For these slicker chips, Eden Tech has developed optimized chip-to-world connection solutions, designed to be more user-friendly. Here, we describe their specifications and operations in detail and provide key user information.

2 Introduction

Flexdym is available in a range of thicknesses, that are adapted to different needs and applications, such as diagnostics, nucleic acid sequencing and organ-on-chip.

Our thickness range helps to ensure high optical transparency of Flexdym™, which has a high transmittance on UV-visible regions (over 50% from 295 to 800 nm). Flexdym™ is ideal when working with a large range of chromophores or fluorophores.

Finally, Flexdym™ is a lightweight material that is particularly well adapted for microfluidic applications that require portable and compact devices, such as microfluidic skin patches, point-of-care testing, or high-volume processing/ analysis.

For thin Flexdym™ chips, Eden Tech offers adhesive luer lock connectors as a solution

3 Flexdym™ Connections Methods

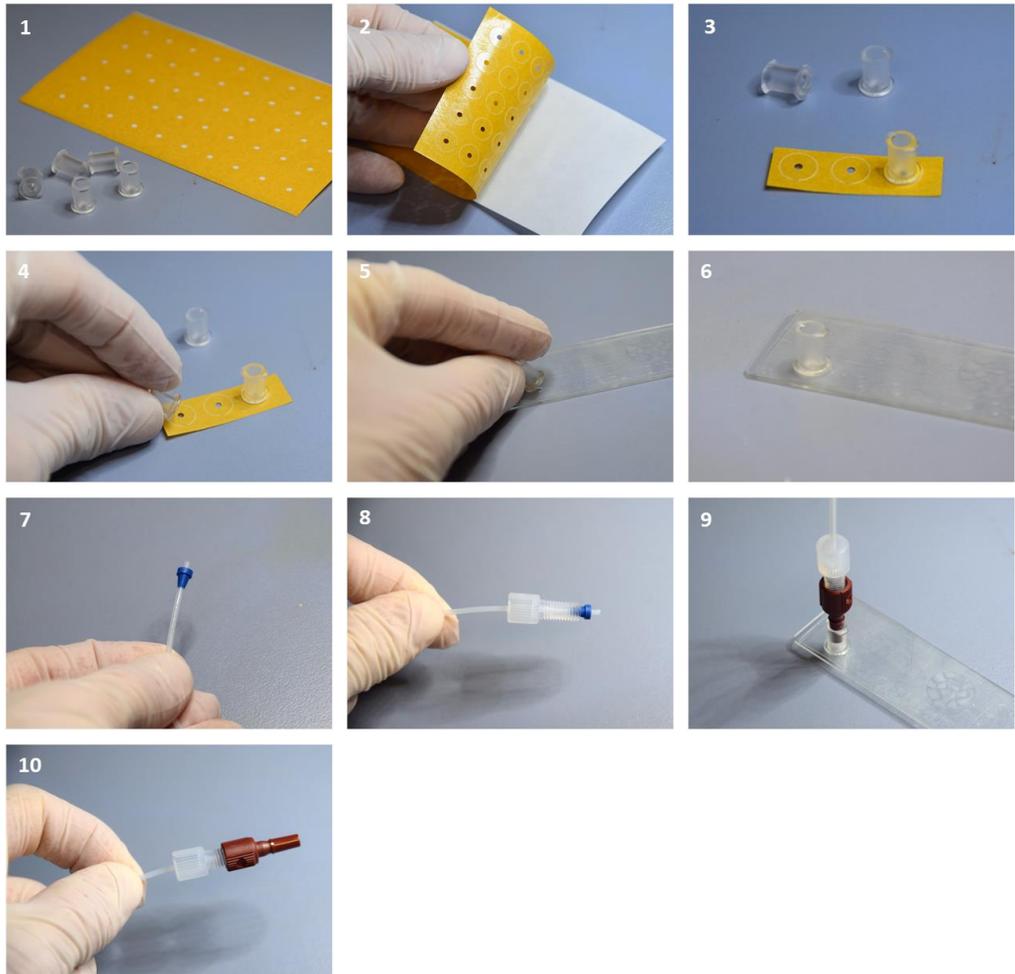
3.1 Adhesive Luer Lock Connectors

This method of connecting Flexdym™ chips uses luer lock connectors. Here, the user can purchase the Eden Tech luer lock connector kit, which contains 10 luer lock connectors & 50 stickers.

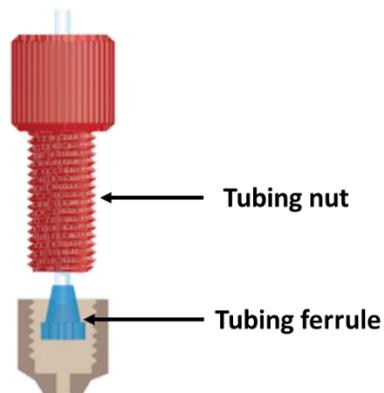
The protocol for this method is as follows:

1. Attach one double-sided circular adhesive pad to the female luer lock connector.
2. Apply the sticky luer connector to the chip and align it with the inlet/outlet.
3. Cut the end of the tubing diagonally and insert into the lock nut, with the nut threads facing the tubing end.
4. Insert tubing into ferrule, through the tapered end.
5. Finally, insert tubing into the male luer lock connector.

The images below show the step-by-step process:



The luer lock nut and ferrule should be positioned on the tubing according to the diagram below:



4 References

Lachaux, J., Alcaïne, C., Gomez-Escoda, B., Perrault, C.M., Duplan, D.O., Wu, P-Y. J., Ochoa, I., Fernandez, L., Mercier, O., Coudrease, D., Roy, E. (2017) Thermoplastic elastomer with advanced hydrophilization and bonding performances for rapid (30 s) and easy molding of microfluidic devices. *Lab on a Chip* 17, 2581-2594. doi: 10.1039/c7lc00488e

Roy, E., Pallandre, A., Zribi, B., Horny, M.C., Delapierre, F.D., Cattoni, A., Gamby, J., & Haghiri-Gosnet A.M. (2016) Overview of Materials for Microfluidic Applications. *IntechOpen*, Chapter 15, 335- 355.

Roy, E., Stewart, G., Mounier, M., Malic, L., Peytavi, R., Clime, L., Madou, M., Bossinot, M., Bergeron, M.G. & Veres, T. (2015) From cellular lysis to microarray detection, an integrated thermoplastic elastomer (TPE) point of care lab on a disc. *Lab on a Chip*, 2015,15, 406-416, doi :10.1039/C4LC00947A



Eden Materials is a division of Eden Tech

Registered Address: 83 Avenue Philippe Auguste, 75011 Paris, France

Client Facing Address: 172 Rue de Charonne, 75011 Paris, France

T; + (33) 188 327 405

E; contact@eden-microfluidics.com

W: www.eden-microfluidics.com