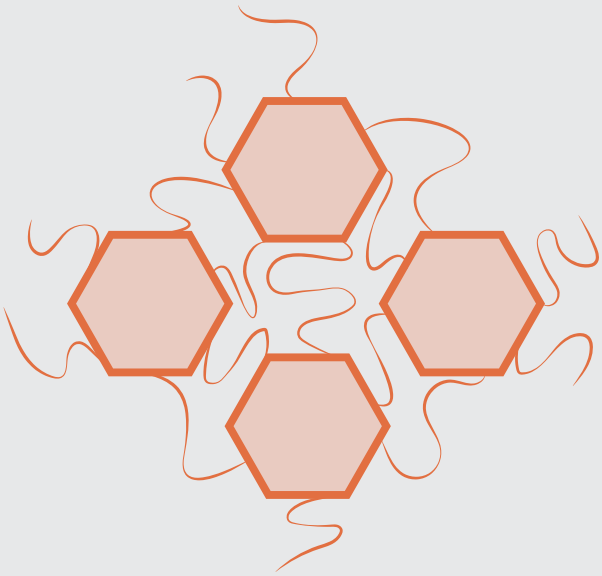
Flexdym for Cell Culture Applications

Untap the Power

The Best of PDMS & Thermoplasts

Flexdym is a soft thermoplastic elastomer, with a **block co-polymer structure:**

- **Soft ethylene-butylene blocks** contribute to softness & bonding performance. Polymer chains remain in motion but do not leach into medium, because they are anchored in styrene.
- **Hard styrene blocks** provide thermoplastic features, compatible with user-friendly hot embossing microfabrication.



PROPERTY	PDMS	THERMOPLASTICS	FLEXDYM
Optical	+	+	+
Deformation	++	-	++
Permeability	++	+/-	+
Hydrophilicity	--	+	+
Biocompatibility	+	+/-	+
Scalability	--	++	++
Assembly	--	-	++

(1) ASTM D1238 (190°C / 5 kg)

CHEMICAL	RESISTANCE
Acids	Resistant
Bases	Resistant
Fluorinated Oils	Resistant
Methanol/ Ethanol	Resistant
Carboxylic Acid	Swell
Hydrocarbons	Non-Resistant
Oil	Swell

SURFACE PROPERTIES

- **Low absorption** of molecules into material adds experimental precision.
- **Recyclable material,** that can be washed/sterilized with gamma or ethylene oxide, and then re-molded via embossing.
- **Moderately hydrophobic,** but O2 plasma results in stable hydrophilicity up to 1 month (according to storage conditions).
- **Surface treatment** similar to other thermoplastics, e.g. via amino-based EDC/NHS coupling, or silane-based.

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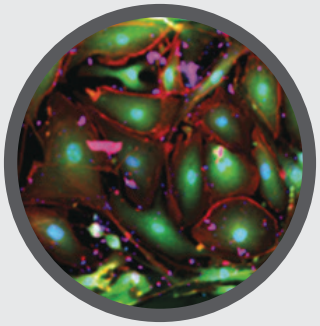
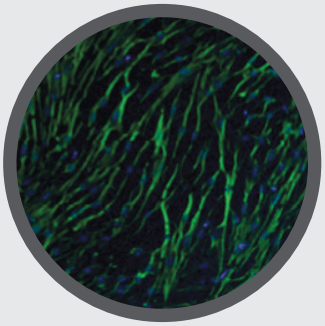
OPTICAL PROPERTIES

- **UV/Vis Spectrum** transmittance at 295-800 nm
- Compatible with commonly used dyes, such as Cy3 & Cy5



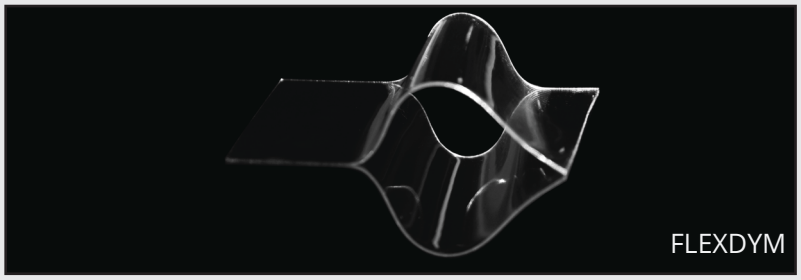
MICE ENDOTHELIAL CELLS[1]



HUMAN DERMAL FIBROBLASTS[2]

BIOCOMPATIBLE PROPERTIES

- **Certified ISO 10993 parts 4,5,6,10 & 11** & **USP Class VI** international standards.



BONDING PROPERTIES

- Lamination via gentle handling and roller, or using a press. No treatments.
- Bonding at room temperature over 1-2 days, or at 85ºC for 1-2 hours.
- Bonding to various substrates, i.e. COC, PC, PS and Glass. Bonding strength rage is 700 mbar to 2 bars.
- Fig. A shows sustained fluidic pressures for fully Flexdym (FD) or FD-PC hybrid devices. Inc. devices incubated at 37 ºC.1
- Fig. B shows burst pressure for fully FD devices through 10 repeated washing-bonding cycles. 2

FIGURE A

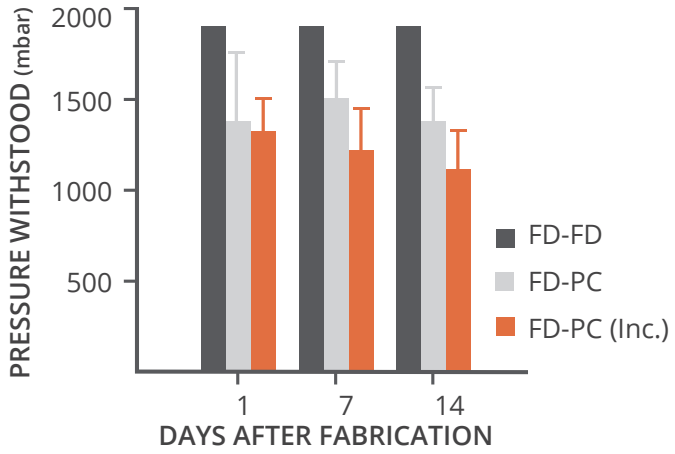
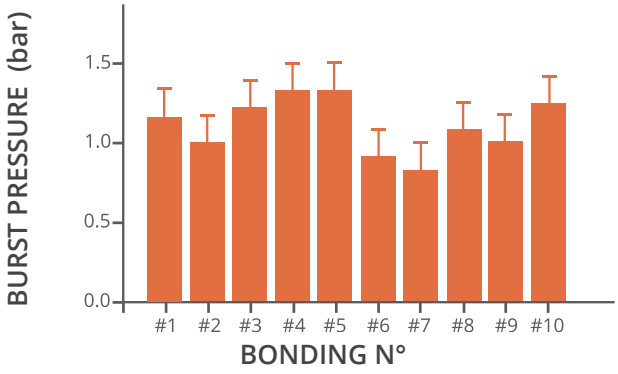


FIGURE B



References: 1. A. McMilan et al., Micromachines (2020) 11, 731. 2. H. Salmon et al., Engineering Reports (2021) e12361. 3. J. Lachaux et al., Lab on a Chip (2017) 17, 2581.