



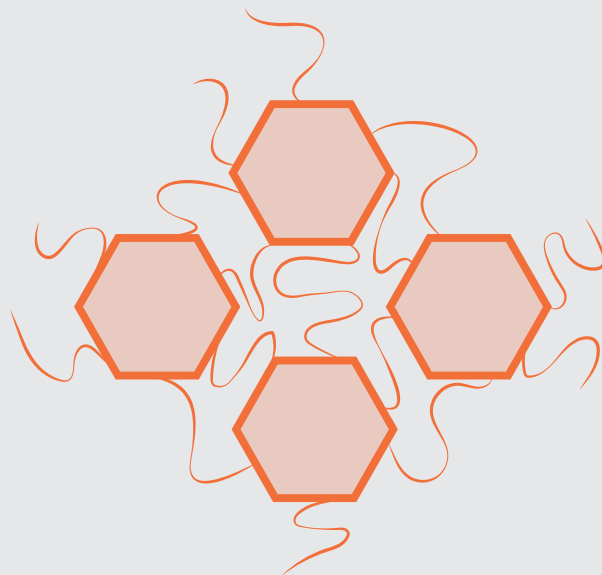
# Flexdym Diagnostic Applications

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	--	-	++

<sup>(1)</sup>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

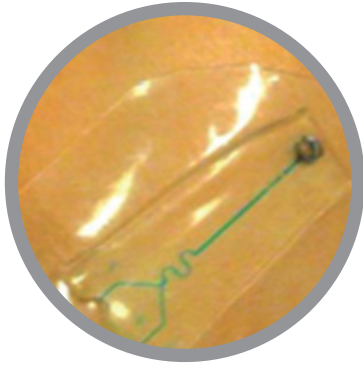
## SURFACE PROPERTIES

- **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 O<sub>2</sub> 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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WEARABLE MATERIAL (REF.3)



LOW-COST ASSEMBLY



LOW-COST SCALE UP

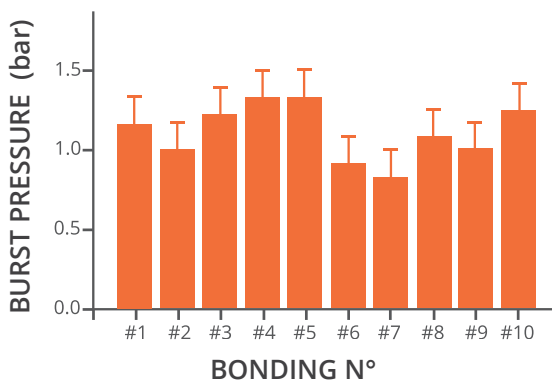
## KEY PROPERTIES

- Certified biocompatible **ISO 10993 parts 4,5,6,10 & 11** and **USP Class VI**.
- **UV/Vis Spectrum** transmittance at 295-800 nm. Compatible with commonly used dyes, e.g. Cy3 & Cy5.
- **Low-cost assembly** requiring no treatments.
- **Scale-up costs** dramatically cheaper than PDS & comparable to thermoplastics.

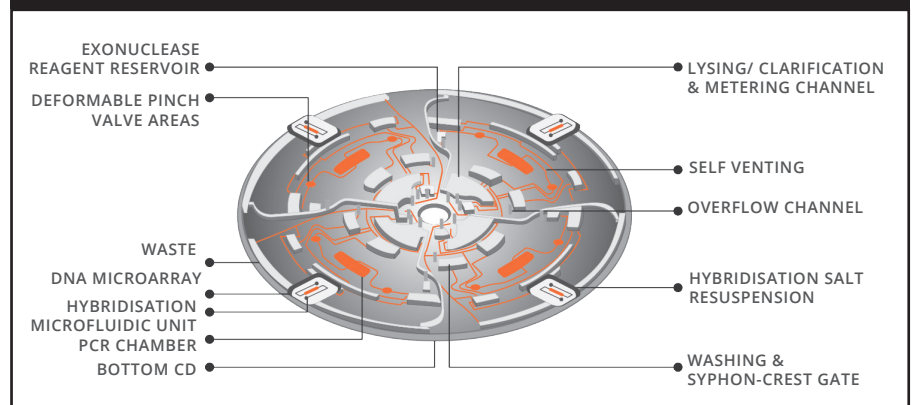
## BONDING PROPERTIES

- **Lamination** via gentle handling and roller, or using a press. No treatments.
- Bonding at **room temperature** over 1-2 days, or at 85°C for 1-2 hours.
- **Bonding to various substrates**, i.e. COC, PC, PS and Glass. Bonding strength range 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 °C.<sup>1</sup>
- **Fig. A** shows burst pressure for fully FD devices through 10 repeated washing- bonding cycles.<sup>2</sup>

FIGURE A



POINT-OF-CARE DEVICE USING FLEXDYM



References: 1. A. McMillan et al., *Micromachines* (2020) 11, 731. 2. H. Salmon et al., *Engineering Reports* (2021) 12361. 3. J. Lachaux et al., *Lab on a Chip* (2017) 17, 2581.