Flexdym™ Polymer

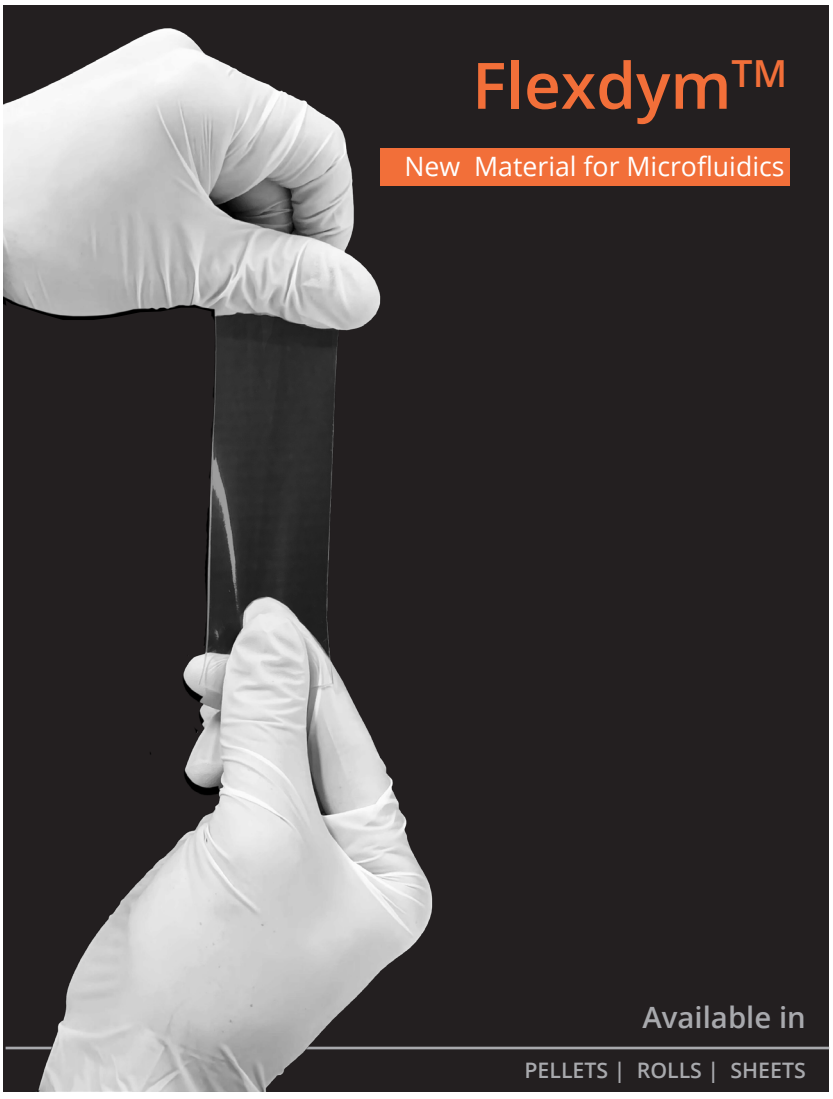
New Biocompatible Material for Microfluidics

MATERIALS

Flexdym™

BIOCOMPATIBLE ELASTOMER FOR MICROFLUIDICS

Flexdym™ is the first material specifically tailored for microfluidics biological applications. It is flexible, easily molded and bonded, transparent, and resistant to adsorption of small particles. This thermoplastic elastomer (TPE-S) can be used at all scales, from prototyping to mass production (i.e. injection, extrusion, roll-to-roll molding, etc.). With Flexdym™, microfluidics tech development is finally streamlined.



APPLICATIONS

- Lab-on-Chip
- Point-of-care diagnotics
- Organ-on-chip
- Cell Culture
- Micro reactions
- Cleantech/Environmental science

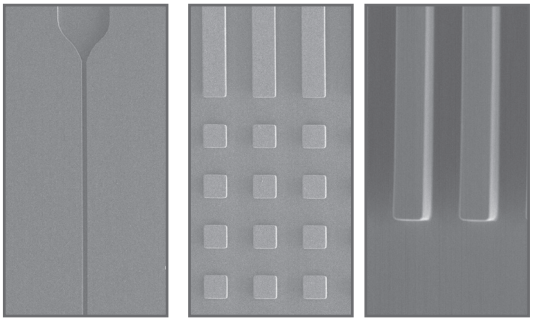
KEY FEATURES

- Flexible thermoplastic
- Prototyping to mass production use
- Biocompatible - USP Class VI
- Low protein adsorption
- Optically clear
- Low fluorescence
- Low water evaporation
- Stable surface chemistry
- Self-stick adhesion

Flexdym™

MOLDING BY EMBOSSING TECHNIQUE

Submicrometer resolution was achieved and high reproducibility of features from 10µm at different array densities was demonstrated.



500µm 200µm 50µm

Flexdym™ Polymer

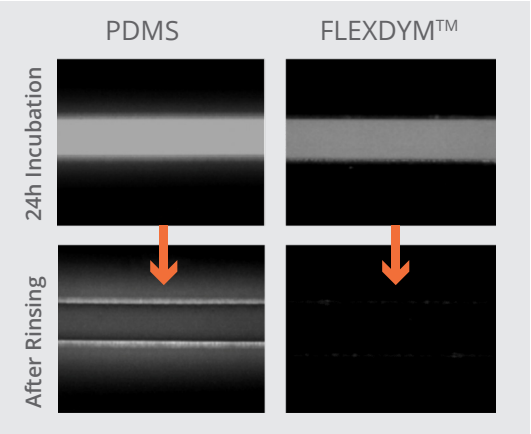
New Biocompatible Material for Microfluidics

MATERIALS

BIO COMPATIBILITY

ADSORPTION AND ABSORPTION

100 µM Rhodamine B for 24h incubation in 50 µm wide channels (PDMS and Flexdym™) The USP Class VI certification allows the use of Flexdym™ for various biological applications. The material exhibits also a low adsorption and is sterilizable with gamma and ethylene oxide.



CHEMICAL COMPATIBILITY

CHEMICAL	RESISTANCE
Acids (excl. CA)	R
Bases	R
Carboxilic acids	Swell
Hydrocarbons	NR
Tensides	R
Oil	Swell
Methanol/ Ethanol	R

OPTICAL PROPERTIES

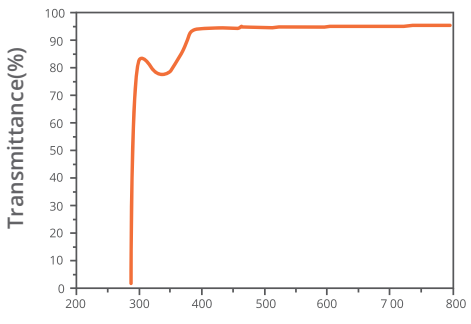
REFRACTIVE INDEX 1.6

TRANSMITTANCE SPECTRA of UV/Visible and IR region for 1300µm thick film.

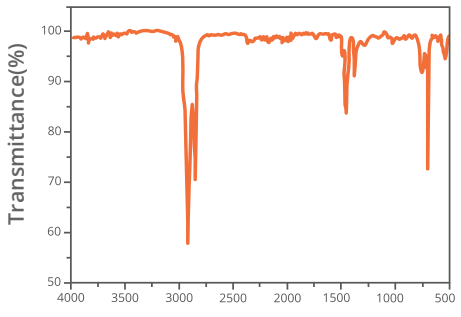
FLUOROCENT ANALYSIS

Flexdym™ exhibits high transmittance on UV visible region (>50 % from 295 nm until 800 nm) which allows to work with a large range of chromophores or fluorophores.

UV/ VIS SPECTRUM



IR SPECTRUM



MECHANICAL PROPERTIES

Hardness Shore	A 35
Specific Gravity	0.9 g/ cm³
Tear Strength	15 kN/ m
Tensile Strength	7.6MPa
Elongation	720%
Melt Flow Rate(1)	2g/ 10min
Young Modulus	1.15 MPa

(1) ASTM D1238 (190°C / 5 kg)

THERMAL PROPERTIES

SERVICE TEMPERATURE	
With Mech. Stress	-50°C - 80°C
Without Mech. Stress	-50°C - 100°C
INJECTION PROCESS TEMPERATURE	
Rear	180°C - 230°C
Centre	180°C - 230°C
Front	180°C - 230°C
Mold	20°C - 50°C
EMBOSSING PROCESS TEMPERATURE	
Molding Temp.	120°C - 200°C
Mold Pre Heat	20°C - 180°C

SURFACE PROPERTIES

DYNAMIC CONTACT ANGLES	
Advancing CA	105° ± 4°
Receding CA	88° ± 4°
STATIC CONTACT ANGLE (PLASMA TREATMENT)	
2min	34.0° ± 2.8°
5min	32.3° ± 5.3°
10min	22.0° ± 1.8°
STICKING BEHAVIOUR (THERMAL AID ADHESION)	
Strong bonding	Flexdym™, PS, COC
Mod. bonding	PC, PMMA, Glass

Bonding behavior vary by material grade

Bonding strength can be enhanced by using a coating agent on the substrate

STORAGE AND HANDLING

No gloves or safety equipment required to handle the material. 2-years warrantly.