Flexdym™ Polymer

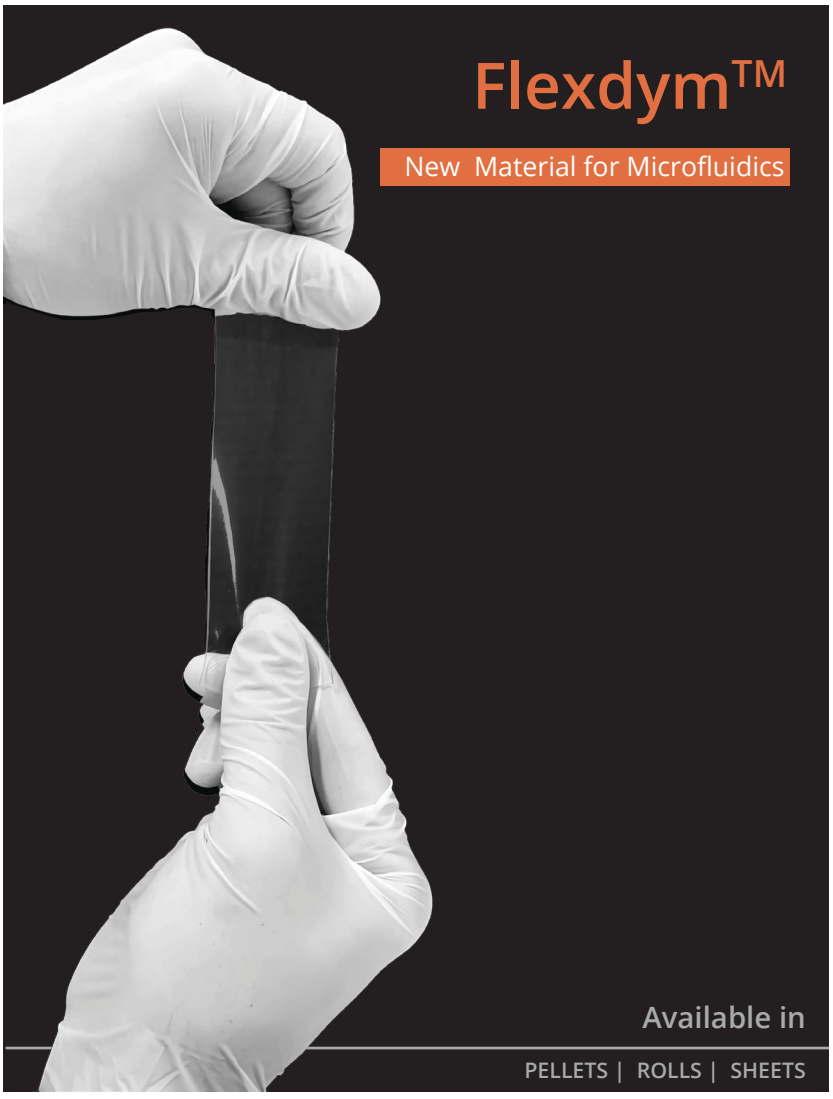
New Biocompatible Material for Microfluidics

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

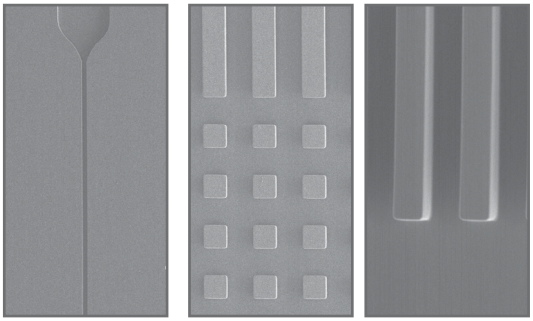
KEY FEATURES

- 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

Thermoplastic materials Flexdym is sold under license to US patents 9,238,346 and 10,369,566 and CA patent 2,681,897 from the CNRC, see website for additional information.

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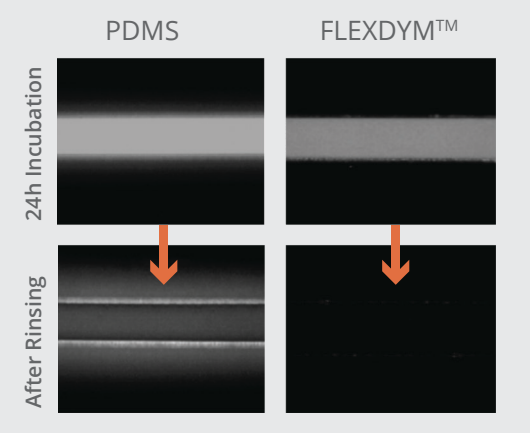
BIO COMPATIBILITY

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

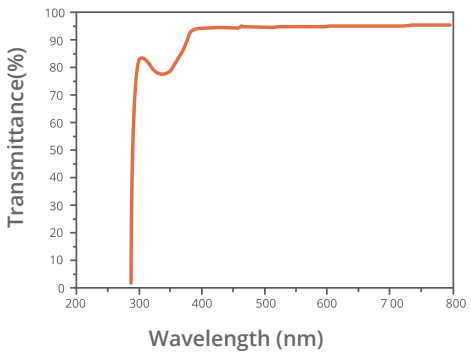
REFRACTIVE INDEX 1.6

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

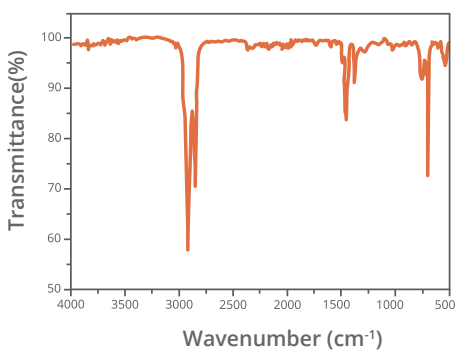
FLUOROCENT ANALYSIS

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.