

Materials List for:

# Fabrication Process of Silicone-based Dielectric Elastomer Actuators

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## Materials

Name	Company	Catalog Number	Comments
High quality PET substrate, 125 µm thick	DuPont Teijin	Melinex ST-506	low surface roughness and absence of defects
Isopropanol 99.9%	Droguerie Schneitter		
Poly(acrylic acid) solution (25%)	Chemie Brunschwig	00627-50	Mw=50 kDa
Automatic film applicator	Zehntner	ZAA 2300	with vacuum table
Profile rod applicator	Zehntner	ACC378.022	22.86 µm
Oven	Binder	FD 115	
Dow Corning Sygard 186 silicone kit	Dow Corning	Sylgard 186	silicone used for casting membranes
Dow Corning OS-2 silicone solvent	Dow Corning	OS2	environmentally-friendly solvent. Mixture of 65% Hexamethyldisiloxane and 35% Octamethyltrisiloxane
Thinky planetary mixer	Thinky	ARE-250	
container PE-HD 150 ml	Semadeni	1972	Container to mix the silicone for the membrane
Medical grade 125 ml PP wide mouth jar with cap	Thinky	250-UM125ML	Container to mix the ink
Bearing-Quality steel balls 12 mm	McMaster-Carr	9292K49	
Universal applicator with adjustable gap	Zehntner	ZUA 2000.220	
Transparency film for overhead projector	Lyreco	978.758	
Dry silicone transfer adhesive (roll)	Adhesive Research	Arclear 8932	
poly(methyl methacrylate) plate 500 mm x 290 mm x 3 mm	Laumat	Plexi 3mm	
Prestretching rig	"home made"		
USB spectrometer for visible light	Ocean Optics	USB4000-VIS-NIR	Spectrometer for the thickness measurement
Tungsten halogen white light source	Ocean Optics	LS-1	Light source for the thickness measurement
400 micrometer optical fiber	Ocean Optics	QP400-2-VIS-NIR	Optical fiber on the spectrometer side for the thickness measurement
600 micrometer optical fiber	Ocean Optics	P600-2-VIS-NIR	Optical fiber on the light source side for the thickness measurement
Carbon black	Cabot	Black Pearl 2000	
Silicone Nusil MED-4901	Nusil	MED-4901	silicone used in conductive ink
Pad-printing machine	TecaPrint	TCM-101	

Thin steel cliché 100 mm x 200 mm	TecaPrint	E052 100 200	Steel plate etched with the design you need to print. The etching is performed by the company selling the cliché.
96 mm inkcup	TecaPrint	895103	Component of the pad printing machine in which the ink is contained
Soft silicone 30 mm printing pad	TecaPrint	T-1013	Printing pad for the pad printing machine
60 W CO <sub>2</sub> Laser engraving machine	Trotec	Speedy 300	To cut frames and foils
Carbon conductive tape	SPI supplies	05081-AB	For electrical connections to the electrodes
4 channels 5 kV EAP controller	Biomimetics laboratory		low power high voltage source to test the actuators. <a href="http://www.uniservices.co.nz/research/centres-of-expertise/biomimetics-lab/eap-controller">http://www.uniservices.co.nz/research/centres-of-expertise/biomimetics-lab/eap-controller</a>