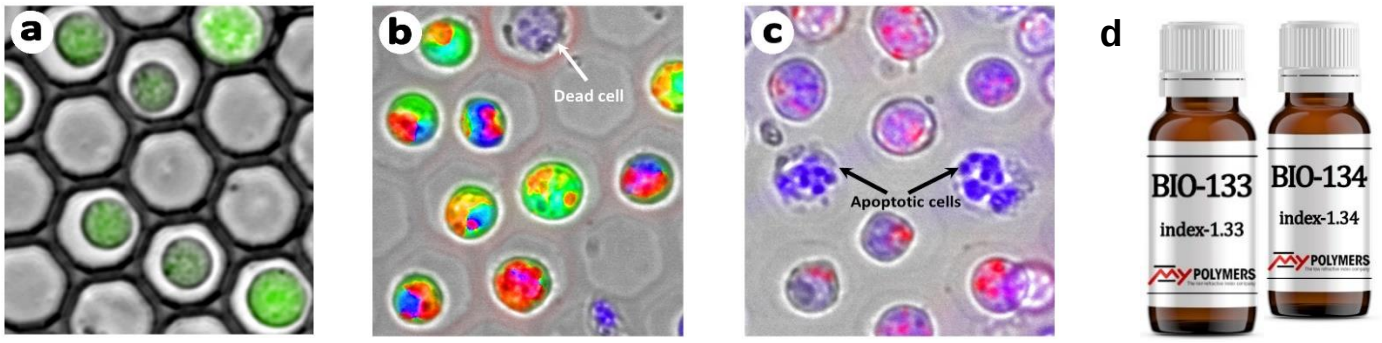
MY POLYMERS
The low refractive index company

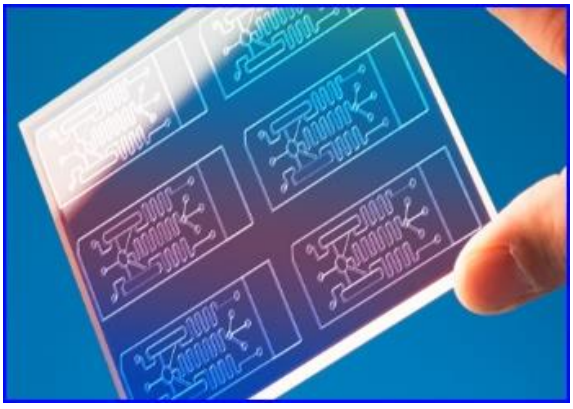
Bio-Photonic Materials (Index=1.33, 1.34)

Matching The Index of Water and Cells enable High Quality Imaging over 3-D structures
There is a special advantage for our polymers in microscope imaging over 3D structures, such as bio-fluidic devices, pico-liter wells or elastomeric micro-pillars. When the structures are made of a polymer with an index of 1.33, it practically eliminates optical distortions. This enables a breakthrough in image quality and resolution.
In order to enable high quality fluorescence microscopy, MY Polymers developed the non-fluorescent UV Cured polymers BIO-133 and BIO-134. These products were also designed to minimize cytotoxicity. Together, with MY-133-V2000 and MY-134, these polymers enable the construction of various 3D structures and 3-D patterned surfaces which do not degrade the image quality.
A breakthrough in image quality was demonstrated when BIO-133, BIO-134 and MY-133-V2000 were used for construction of microfluidic devices, micro-chambers/micro-plates and micro-pillars.
Micro-Chamber Arrays: The picture below demonstrates the improvement in live cell Image quality when our materials, BIO-133 and BIO-134 are used for fabricating a micro chamber array, compared with PDMS:

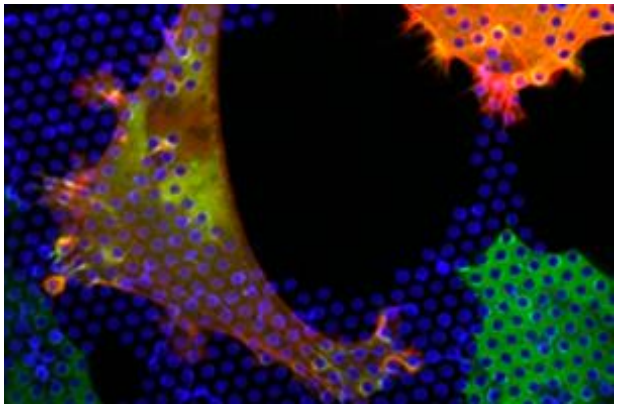


Imaging of live cells over a micro-plate array: ***a.*** *PDMS Array (n=1.42) – Cells are blurred, chamber walls visible.* ***b.*** *BIO-134 Array (n=1.34) – improved cell images (dead cell visible), chamber walls faded.* ***c.*** *BIO-133 Array (n=1.33) – High definition cell images (2 apoptotic cells visible), chamber walls hardly visible. (a, b, c – Courtesy of Bar-Ilan University).* ***d.*** *BIO-133 (index=1.33) BIO-134 (index=1.34), non-fluorescent, minimized cytotoxicity*

Microfluidic Devices and 3-D Micro-Pillars: A recently published paper describes Soft Lithography Fabrication of Index Matched Microfluidic Devices, fabricated using MY-133-V2000, for reducing artifacts in fluorescence and quantitative phase imaging. The paper includes detailed description of the method of construction of the micro-fluidic device and the significant improvement in image quality. The paper concludes that MY-133-V2000 is an attractive alternative for biomedical applications requiring high precision optical imaging.

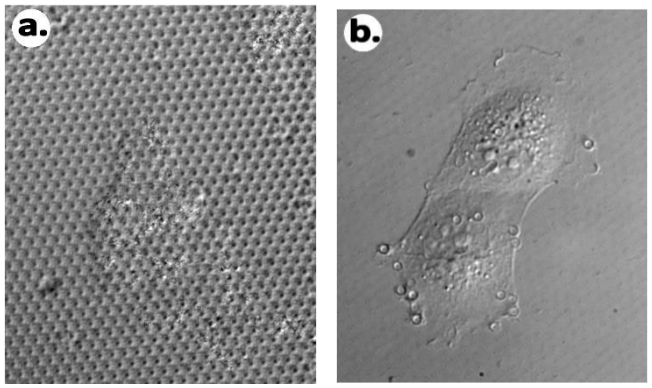


Microfluidic devices produced with MY-133-V2000 or BIO-133 (index=1.33) reduce artifacts in fluorescence and quantitative phase imaging, due to index matching.



MY-134 Micro-Pillars. Micro-pillars are used in the research of interactions between cells and their microenvironment. (Courtesy of National University of Singapore)

Another paper demonstrated the optical advantages of using MY-134 micro-pillars in the research of the interaction of cells with the microenvironment, which has emerged as a major field in bioengineering, and stem cell research.
The index matching eliminates the optical distortion and enables a significantly improved imaging resolution. The paper includes a detailed description of the fabrication method of the micro-pillars. It concludes that the use of the index matched MY-134 enables to measure cell-substrate forces in a way that is similar to the commonly used PDMS micro-pillars approach, but with the advantage of unperturbed optical resolution.
Note: BIO-133 and BIO-134 have been designed to improve MY-133-V2000 and MY-134 by eliminating their fluorescence and reducing their cytotoxicity.



Imaging over 3-D Micro-Pillars. ***a.*** *PDMS micro-pillar degrade the cell image.* ***b.*** *MY-134 Micro-Pillars enable improved image quality.(Courtesy of National University of Singapore)*

MY-133-MC TIRFM Calibration slide. (Courtesy of Max Planck Inst. Of Biochemistry)

Coating with the Moisture Cured MY-133-MC
MY-133-MC finds uses in fabrication of calibration slides for TIRFM microscopy, construction of SPR bio sensors, and other applications requiring a coating with an index of 1.33, that can be applied using a simple coating process. MY-133-MC is Moisture Cured. It cures spontaneously after coating through exposure to the humidity in the atmosphere. The picture above shows a calibration slide for TIRF Microscopy, which was produced by coating multiple layers of MY-133-MC.

Materials commonly used in bio-photonic applications:
The table below includes our most widely used bio-photonic materials.
BIO-133 and BIO-134 have refractive index of 1.33 and 1.34, respectively. These material were designed specifically for bio-photonic applications, and they are distinguished by a being non-fluorescent and by their low cyto-toxicity. These materials are used in the construction of various 3-D devices and 3-D structured surfaces, including micro-chamber arrays, microfluidic devices, and micro-pillars. MY-133-V2000 and MY-134 are sometimes preferred, in these applications, due to their longer shelf life
BIO-133, BIO-134, MY-133-V2000 and BIO-134 are UV cured. However, MY-133-MC is Moisture-Cured. There is no need for UV curing. The material cures spontaneously by exposing it to the moisture in the atmosphere. The moisture triggers the curing reaction. It is therefore, ideal for **coating** over surfaces, especially when a simple coating method is required.

Product	RI @ 589nm	RI @ 950nm	CURE	Adhesion g/cm²	Elastic Modulus MPa	Viscosity CPS	Tensile MPa	Elongation at Break %	Hardness, Shore	Shelf Life, months
BIO-133	1.334	1.329	UV	NA	5	2200	NA	60	70A	6
BIO-134	1.342	1.337	UV	NA	5.6	5500	NA	36	71A	6
MY-133-V2000	1.333	1.329	UV	9	5.2	2900	2.4	60	70A	12
MY-134	1.344	1.338	UV	6	5.6	5000	1.8	40	70A	12
MY-133-MC*	1.330	1.325	MC	NA	NA	400	NA	NA	~80A**	6

* Moisture Cured coating **Estimation

About MY Polymers Ltd.
Distinguished by its total focus on low refractive index materials, ***MY Polymers*** *is a leader in this field.*
MY Polymers *has been active in the field of Low Refractive Index Optical Coatings, Adhesives and Polymers since 2004. The company develops, produces, and sells primary coatings for optical fibers, recoating materials, optical adhesives, bio-photonic materials, anti-reflective coatings, and various other low index polymers, coatings and adhesives.*
MY Polymers *is ISO certified. We serve the global Photonics and Electronic Display industries, with customers in the North America, Asia and Europe.*

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