**For Immediate Release: 10 July 2019**
**PR# 1-19**

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# Polyscope Polymers Introduces New SMA / PMMA Alloy for Industry-Changing Point-of-Care (POC) Medical Test Devices

**GELEEN, The Netherlands** — A new engineering thermoplastic alloy combining the benefits of styrene maleic anhydride (SMA) and polymethyl methacrylate (PMMA) has been developed by Polyscope Polymers B.V. (here) to meet the needs of the rapidly growing point-of-care (POC) microfluidic medical-test device segment. The material is in use on devices completing their final agency reviews and that are expected to be commercially available to medical professionals in the near future. The injection-moldable polymer, called XILOY™ SO2315 SMA/PMMA alloy, offers excellent optical properties, biocompatibility with a variety of proprietary coatings, reagents, and blood and tissue products, and maintains high dimensional stability to assure accurate and reliable immunoassay test results.

The healthcare industry currently is experiencing a step-change thanks to the introduction of new technologies that are designed to lower costs and improve patient outcomes[1]. These include use of electronic patient records, improvements in organizational-management processes, development of accountable-care organizations (ACOs), and the linking of provider reimbursement to quality metrics instead of the traditional fees-for-services payment model common in privatized and decentralized insurance-based health care systems like that in the U.S. A major enabler of these trends — particularly in remote or resource-poor areas with limited healthcare infrastructure and equally limited access to quality and timely medical care — has been the development of POC diagnostic devices. These small (often handheld) units are used to diagnose and monitor various diseases and conditions in primary-care locations like physician offices, hospitals, or even patient homes. In just a few minutes, medical personnel and patients have test results back vs. days-to-weeks when samples must be sent away to external test labs. This significantly reduces the time that patients and physicians must wait for test results, speeding referrals and/or access to appropriate care, and may eventually reduce testing costs. For a range of conditions, health-technology expert Milos Todorovic, Ph.D., MT Analytics Group founder and managing consultant (Niskayuna, N.Y., U.S.) predicts that initially use of POC devices and their consumables will center on hospitals, clinics, and physician offices. However, longer term, as regulators and consumers gain confidence in the technology, that trend will shift to direct consumer diagnosis and condition monitoring at home and in assisted-living locations rather than traditional healthcare settings.

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[1] Learn more: https://www.meddeviceonline.com/doc/things-you-need-to-know-about-the-point-of-care-technology-market-0001

A key element to the accuracy and speed of POC test devices has been developments in the emerging field of microfluidic chips. Molded from transparent thermoplastics, these disposable cassettes feature functional substrates that are modified for surface reactivity and must maintain 50-100-µm-wide molded microchannels for routing tiny amounts of human fluids as well as reagents for diagnostic tests. By using such a small amount of fluids for diagnosis, patients are kept more comfortable (since blood and other fluid draws are much smaller) and quantitative immunoassay test results are returned much faster due to short diffusion distances, high surface/volume ratios, and better thermal control. At present, both polystyrene (PS) and cyclic olefinic copolymer (COC) are used to mold the disposable cassettes, but each material has its challenges. While PS offers good transparency, it lacks inherent surface reactivity, which necessitates a post-mold functional coating step and adds cost and time. And COC, a fairly new polymer, is expensive.

The newest material being used to mold microfluidic cassettes is an alloy of SMA and PMMA. The specific reactivity of anhydride groups on the SMA portion of XILOY SO2315 copolymer is especially helpful in microfluidic chip applications for its intrinsic ability to react with the "bioanchor," which captures and binds to analytes (substances/chemicals of interest, e.g. amino acids, peptides, proteins) in the fluid sample, simplifying the post-mold coating process while, at the same time, making it more robust and cost-effective. SMA also provides higher thermal stability[2] than PS for tests requiring heat to process samples, plus it maintains very-high dimensional stability to assure microchannels operate properly and cassettes fit into test devices. SMA is not especially miscible with PS, leading to a copolymer that is more opaque than transparent. Instead, chemists combine it with PMMA, with which it is highly miscible. The PMMA portion of the copolymer provides excellent transparency[3] for optical detection test methods and has good biological compatability with human tissue and fluids. The resulting copolymer is chemically compatible with the proprietary coatings and reagents typically used on microfluidic cassettes. It also processes easily and maintains consistent tight dimensions for intricate molded micropatterns that are critical to accurate and reliable rest results.

In addition to use for disposable microfluidic cassettes for POC medical diagnostic devices, XILOY SO2315 copolymer is also appropriate for use in a variety of demanding applications in lighting, display, housewares, and consumer disposable applications.

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[2] XILOY SO2315: glass-transition temperature ($T_g$) = 125°C; thermal stability to 112°C
[3] Luminous transmission @ 400 nm = > 90%, Haze = <7%

## About Polyscope Polymers

Polyscope Polymers B.V. is the global leader in research, product development, production, and supply of styrene maleic anhydride (SMA) copolymers, compounds, and aqueous solutions as well as styrene maleic anhydride N-phenylmaleimide (SMANPMI) terpolymers. The company offers a broad range of SMA and SMANPMI co- and terpolymers and compounds for engineering plastic and specialty chemical applications under the trade names XIRAN® and XILOY™. Resins can be created with a very broad range of molar mass and levels of maleic anhydride. For engineering plastics, SMA/ABS-based compounds with a broad range of impact modification and glass-fiber loading levels can be produced. For specialty-chemical applications, low-molecular weight XIRAN-based resins and solutions are chemically modified to meet customer needs. A global customer base is supported from corporate headquarters by both production and research & development conducted from Geleen, The Netherlands, and with local compounding, contract manufacturing facilities, and sales and marketing support in Europe, North America, and Asia. For more information, see **www.polyscope.eu.**

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**GELEEN, The Netherlands** — The healthcare industry currently is experiencing a step-change thanks to new technologies designed to lower costs and improve patient outcomes. These include use of electronic patient records, improvements in organizational-management processes, development of accountable-care organizations, and the linking of provider reimbursement to quality metrics instead of the traditional fees-for-services payment model common in privatized and decentrailized insurance-based health care systems like that in the U.S. A major enabler of these trends — particularly in remote or resource-poor areas with limited healthcare infrastructure and equally limited access to quality and timely medical care — has been the development of point-of-care (POC) diagnostic devices. These small (often handheld) units are used to diagnose and monitor various diseases and conditions in primary-care locations like physician offices, hospitals, or even patient homes. In just a few minutes, medical personnel and patients have test results back vs. days-to-weeks when samples must be sent away to external test labs. This significantly reduces the time that patients and physicians must wait for test results, speeding referrals and/or access to appropriate care, and may eventually reduce testing costs.

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**ATTENTION EDITORS: High-resolution digital photography available upon request.**

*Photo courtesy of iStockPhoto.com*

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**GELEEN, The Netherlands** — A key element to the accuracy and speed of point-of-care (POC) test devices has been developments in the emerging field of microfluidic chips. Molded from transparent thermoplastics, these disposable cassettes feature functional substrates that are modified for surface reactivity and must maintain 50-100-µm-wide molded microchannels for routing tiny amounts of human fluids as well as reagents for diagnostic tests. By using such a small amount of fluids for diagnosis, patients are kept more comfortable (since blood and other fluid draws are much smaller) and quantitative immunoassay test results are returned much faster due to short diffusion distances, high surface/volume ratios, and better thermal control. A new engineering thermoplastic alloy combining the benefits of styrene maleic anhydride (SMA) and polymethyl methacrylate (PMMA) has been developed by Polyscope Polymers B.V. (here) to meet the needs of the rapidly growing POC microfluidic medical-test device segment. The injection-moldable polymer, called XILOY™ SO2315 SMA/PMMA alloy, offers excellent optical properties, biocompatibility with a variety of proprietary coatings, reagents, and blood and tissue products, and maintains high dimensional stability to assure accurate and reliable immunoassay test results. It is in use on devices completing their final agency reviews and that are expected to be commercially available to medical professionals in the near future.

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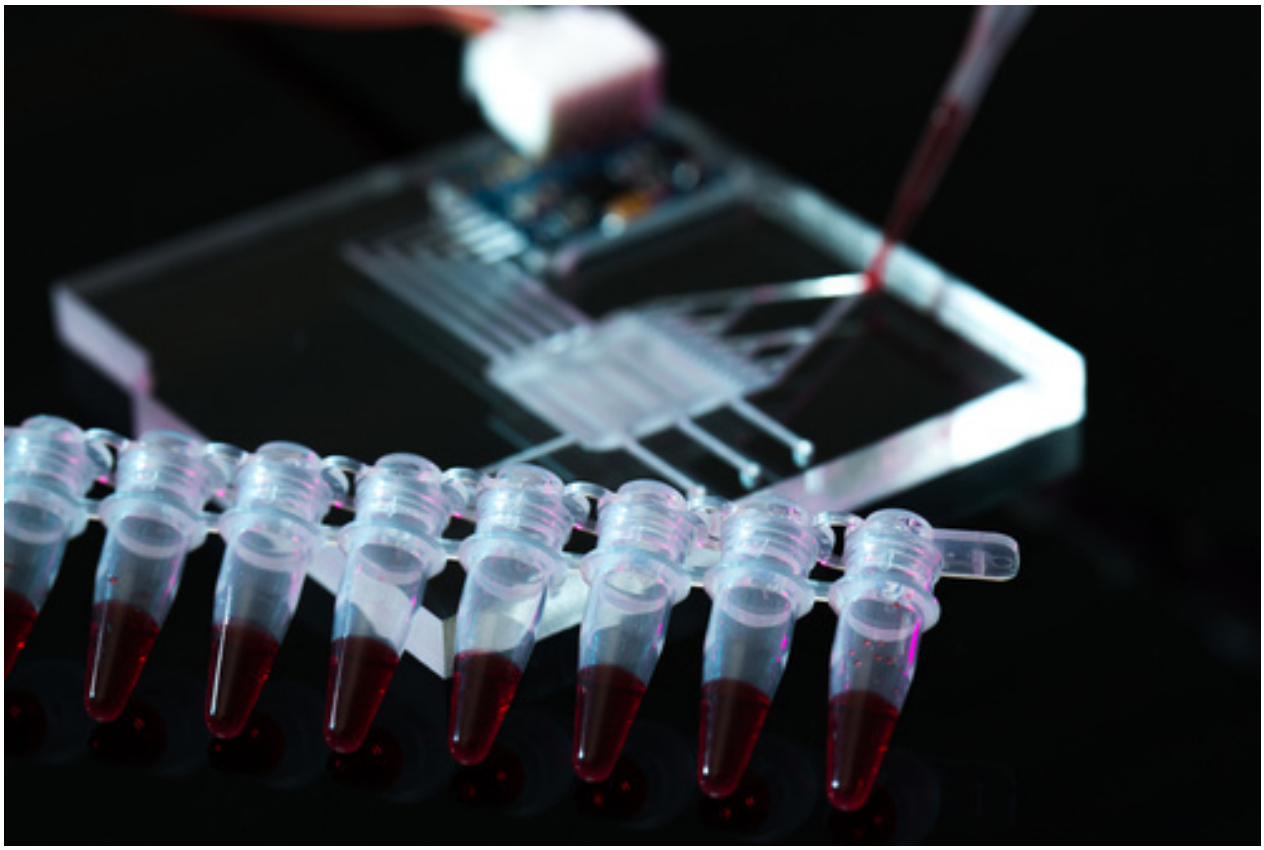
*Photo courtesy of Fotolia.com*



**For Immediate Release: 10 July 2019**
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**GELEEN, The Netherlands** — The newest material being used to mold disposable microfluidic cassette for point-of-care (POC) immunoassay test devices is an alloy of styrene maleic anhydride (SMA) and and polymethyl methacrylate (PMMA). The specific reactivity of anhydride groups on the SMA portion of XILOY SO2315 copolymer is especially helpful in microfluidic cassette applications for its intrinsic ability to react with the "bioanchor" that captures and binds to analytes (substances/chemicals of interest, e.g. amino acids, peptides, proteins) in the fluid sample, simplifying the post-mold coating process while, at the same time, making it more robust and cost-effective. The PMMA portion of the copolymer provides excellent transparency for optical detection test methods and has good biological compatability with human tissue and fluids. The resulting copolymer is chemically compatible with the proprietary coatings and reagents typically used on microfluidic cassettes. It also processes easily and maintains consistent tight dimensions for intricate molded micropatterns that are critical to accurate and reliable rest results.

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