

Solvay to Make Strong Case for Metal-to-Plastic Conversion at SPE Medical Plastics Minitec

Hip Retractor Case Study is Latest Example Showcasing the Benefits of High-Performance Polymers over Metals in Medical Devices

ALPHARETTA, Ga., October 29, 2014 – Solvay Specialty Polymers – a leading global supplier of high-performance thermoplastics offered for use in a range of markets including implantable and non-implantable medical devices – will deliver a broad-ranging technical presentation on the benefits of high-performance polymers over metals in the healthcare industry. Trevor Spence, sales development manager for Solvay Specialty Polymers, will present a talk entitled “Coming to Grips with Metal-to-Plastic Conversion for Instruments in Healthcare” at the Medical Plastics Minitec, sponsored by the Philadelphia section and the Medical Plastics Division of the Society of Plastics Engineers (SPE) Nov. 6 at the Desmond Hotel and Conference Center in Malvern, Pa.

Spence’s presentation will provide an overview of the innovative use of high-performance polymers for surgical retractors for hip replacement which are typically made of metal. Surgical retractors made of Ixef® polyarylamide (PARA) and AvaSpire® polyaryletherketone (PAEK) show strong promise and are the latest examples from Solvay that showcase the advantages of high-performance polymers over metals in medical devices. The report reveals drastic cost reductions with the use of plastics. Designing in plastic also enables the OEM to sell single-use instrumentation, which is rarely economical using metal.

Resources for designing with plastics are expanding within the medical industry, according to Solvay. Plastic material suppliers are increasing their focus on the medical industry, and adding resources to aid in plastic adoption and metal-to-plastic conversion. Processors who traditionally have worked exclusively with metals are adopting and generating expertise with plastic manufacturing methods. In addition, OEMs are hiring designers with a background in plastics. With steadily increasing healthcare costs and vast technology improvements, designers across the medical field are learning to increase performance and decrease costs through the utilization of specialty plastics, according to the company.

An active participant in the metal replacement market for over 25 years, Solvay undertook an innovative commercial approach by applying its knowledge and expertise to develop case studies that help customers see the cost and performance advantages of high-performance polymers in medical devices. Plastics can be used to replace steel devices by incorporating simple design modifications. This report provides a foundation for polymer selection and documents a complete metal-to-plastic conversion of a retractor used in total hip replacement (THR). The case study focuses on both single-use and reusable retractors.

“Specifying plastics for medical devices can be a major challenge for those who have been used to working with and designing with metals,” said Spence. “To help customers make this transition, we conducted an in-depth study on end-use performance, biological safety, and economics, and we developed a practical six-step metal replacement plan.”

A hip retractor was chosen to demonstrate metal-to-plastic conversion for two reasons. First, retractors used in orthopaedics are largely composed of metal and second, the primary requirements of a retractor are high strength and stiffness. This report breaks down the metal-to-plastic conversion of the hip retractor into six steps including classification of polymers, material selection, improving strength and stiffness, prototyping, manufacturing, and validation.

Spence noted that high-performance polymers offer the same level of strength and rigidity as some metals at ambient temperature along with added advantages. High-performance polymers deliver cost benefits, enhanced aesthetics, and ergonomic improvements including a range of grip options. They can also be colored, thus enabling the production of devices in a variety of sizes that can be easily and quickly identified in the operating room.

The Hohmann retractor, a popular device used in THR surgical procedures, presents challenging requirements including high mechanical loads. In single-use applications, Ixef[®] PARA is used due to its strength and stiffness, excellent surface finish, and compatibility with gamma radiation sterilization. Ixef[®] PARA's strength surpasses that of known competitive thermoplastics, including carbon fiber-reinforced polyetheretherketone (PEEK). This enables instrument designs which offer comparable performance to that of their stainless steel counterparts. The material is injection molded, thus eliminating machining and reducing cost over stainless steel.

For reusable devices, AvaSpire[®] PAEK delivers a range of advantages including a high stiffness-to-weight ratio, hydrolytic stability at elevated temperatures, excellent chemical resistance, as well as excellent aesthetics and colorability.

Stiffness, strength, and compatibility with disinfectants and steam sterilization are critical requirements for reusable retractors, making AvaSpire[®] PAEK ideal for these applications. The material is also easy to process, allowing designs incorporating long, thin geometries to be produced via injection molding.

Solvay seeks to grow the metal replacement market by presenting these types of case studies directly to customers and also offering them at educational meetings throughout the country including the recent American Academy of Orthopedic Surgeons (AAOS) conference in New Orleans and the MD&M East conference and exhibition in New York City.

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About Solvay Specialty Polymers

Solvay Specialty Polymers (www.solvayspecialtypolymers.com) is a leading global supplier of high-performance thermoplastics for permanent and prolonged exposure implants and limited exposure devices. The company has expanded its focus on the healthcare industry to meet the growing needs of its global customers by providing global technical and regulatory support. Solvay is building on its 25-year history as a key material supplier in the healthcare field, devoting considerable new resources to help customers be more efficient and cut costs. Metal-to-plastic replacement remains a key focus for manufacturers, but increased cost pressures pose a new challenge as the market continues to grow at a double-digit pace. Solvay also continues to devote considerable research and development activities to polymer technology and commercialization of new and unique material options for medical OEMs and processors.

Solvay Specialty Polymers manufactures over 1500 products across 35 brands of high-performance polymers – fluoropolymers, fluoroelastomers, fluorinated fluids, semi-aromatic polyamides, sulfone polymers, aromatic ultra polymers, high-barrier polymers and cross-linked high-performance compounds – for use in Aerospace, Alternative Energy, Automotive, Healthcare, Membranes, Oil & Gas, Packaging, Plumbing, Semiconductors, Wire & Cable, and other industries. Learn more at www.solvay.com.

Solvay (www.solvay.com) is an international chemical Group committed to sustainable development with a clear focus on innovation and operational excellence. It is realizing over 90% of its sales in markets where it is among the top 3 global leaders. Solvay offers a broad range of products that contribute to improving quality of life and the performance of its customers in markets such as consumer goods, construction, automotive, energy, water and environment, and electronics. The Group is headquartered in Brussels and its companies, which employ about 29,400 people in 56 countries, generated EUR 9.9 billion in net sales in 2013 (pro forma). Solvay SA is listed as **SOLB** on NYSE Euronext (www.euronext.com) in Brussels and Paris. Bloomberg (www.bloomberg.com) = **SOLB:BB** and Reuters (www.reuters.com) = **SOLB.BR**.

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