Novel Stethoscope Using Solvay's Radel® PPSU is First to Assess Injured in High-Noise Environments

Active Signal Technologies' Noise-Immune Device Detects Heart/Lung Activity in Combat Casualty and Civilian Emergency Situations

Active Signal Technologies Inc., Linthicum Heights, Md., a leading contract research firm specializing in electromechanical devices, has developed the first stethoscope that can detect heart/lung activity in high ambient noise (above 90 dBA) including combat casualty and civilian emergency medical environments. The A SCOPE™ dual-mode noise immune stethoscope features a front face made of Radel® polyphenylsulfone (PPSU) resin from Solvay Specialty Polymers USA, LLC, which provides biocompatibility, toughness, and strong chemical resistance.

In cooperation with the U.S. Army's Aeromedical Research Laboratory (USAARL) in Ft. Rucker, Ala., Active Signal Technologies developed a noise immune stethoscope that has been tested in simulated Blackhawk helicopter environments up to 110 dBA, the limit of USAARL's acoustic reverberation chamber. The noise can be from rotary and fixed wing aircraft as well as ambulances where the prevailing sound levels preclude auscultation (listening to internal body sounds) with standard stethoscopes. Without this capability, patients can potentially expire from undetected collapsed lungs or loss of intubation integrity, according to the company. The device uses a combination of highly sophisticated sensors, signal conditioning, and Doppler technology to detect physiologic activity.

Radel® PPSU's documented biocompatibility is a key feature for the stethoscope's injection molded front flat face which comes in contact with the patient's skin, according to Arthur Cooke, president of Active Signal Technologies. The two-inch wide, 0.10-inch thick part has reinforcing ribs and ultrasonically welded bosses around the circumference. The front face attaches to internal screws in the stethoscope's aluminum housing.

Radel® PPSU provides better toughness than polycarbonate and its chemical resistance enables the device to withstand harsh medical substances including cleaning agents, alcohol, and chlorinated solvents. The material's strong dimensional stability also permits the front face to mate tightly to the aluminum housing. The injection molding process allows for higher production rates and more cost-effective manufacturing on a per part basis. The device has passed a comprehensive series of MIL-STD 810F [1] environmental tests, is FDA approved (510(k) Number K103499), and was deployed to Afghanistan for field evaluation in late 2011.

Radel® PPSU is a super-tough thermoplastic with high heat resistance, exceptional hydrolytic stability, and excellent chemical resistance. Radel® PPSU is also

compliant with ISO 10993-1 for limited exposure, non-implantable applications.

Solvay Specialty Polymers is a global leader in the development of sulfone polymer technology, launching Udel® polysulfone nearly 45 years ago. In addition, Solvay's experience as a key materials supplier in the healthcare field spans more than 20 years. The company is a leading manufacturer of high-performance plastics, offering a broad range of materials for healthcare instruments and medical devices. More recently, Solvay has successfully introduced its line of Solviva® Biomaterials and offers them for use in a range of implantable devices.

About Active Signal Technologies
Active Signal Technologies was founded in 1996 by the core members of the advanced sensor and solid state actuator group at Lockheed Martin's corporate lab in Baltimore, Md. The company performs cutting-edge research and development into devices and systems based on piezoelectric, magnetostrictive, and electrostrictive materials. Several devices have been developed using these "smart materials" and associated technologies. These include the Brain Acoustic Monitor (BAM), a device to assess traumatic brain injury based on acoustic characterization of cerebral perfusion and high-frequency (above 1KHz) hydraulic valves and a solid state pump employing smart material actuators for next-generation aircraft flight controls. Other technologies include high-temperature capacitors made from novel ceramic dielectric materials with excellent performance to 200°C and above and broadband graphite composite under-water communications transducers (WQC-6) used on Trident submarines. For more information, visit www.activesignaltech.com [2].

About Solvay Specialty Polymers
Solvay Specialty Polymers is a leading global supplier of high-performance thermoplastics for implantable and non-implantable medical devices. The company has expanded its focus on the healthcare industry to meet the growing needs of its global customers. Last year, Solvay announced a new organizational structure and a 50% increase in staffing for sales, marketing, and technology functions in the U.S. and Europe. Plans for further expansion in Asia-Pacific are also underway. Solvay is building on its 20-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 more products with more performance than any other polymer company in the world. The company supplies over 1500 products across 33 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 markets. Learn more at www.solvayspecialtypolymers.com [3].

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