

FOR IMMEDIATE RELEASE:

**SILICONE DRIVES ‘SUDDEN-DEATH’ DESIGN VICTORY:
SHIN-ETSU SILICONES’ LIMS SERIES ACHIEVES ERGONOMIC ADVANCEMENTS
FOR FOOTBALL COACH’S HEADSET DESIGN.**

Akron, OH– February, 2013

In an effort to improve sideline communications for football coaches, Shin-Etsu Silicones of America (SESA: A U.S. subsidiary of Shin-Etsu Chemical Co. Ltd., Japan) recently collaborated on the development of an advanced performance, ‘in-game’ headset design. Instrumental to the ergonomic improvements of the new headset design is the integration of specially engineered materials from the advanced LIMST™ (Liquid Injection Molding System) silicone product line including: KEG2000-70 / KE1950-10 / KE2090-70.

SESA collaborated with its full-service contract manufacturing client who was selected to come up with a turn-key manufacturing solution on an extremely short timeframe that would solve issues in key design areas (KDAs) of an existing headset design—headband, temple pad, boom areas, etc. Since headsets experience the extremes of heat-to-freeze weather during a typical football season—and the extreme abuse of football coaches during a game; the new design had to significantly improve on the aforementioned KDAs.

DESIGN TEAM CHALLENGE:

The previous headset incarnation utilized Thermoplastic Elastomer (TPE) resin which had tearing failures in flexible areas. Additionally, there was significant fading, scratching, and erosion of the pad-printed logo on the headband and boom areas that was essential to maximize potential on-air branding. To tackle these issues SESA collaborated with a supply chain team to maximize in-game communication capabilities via a lighter, thinner, more durable and ergonomically advanced headset for football coaches on all levels.

SILICONE SOLUTION:

Essential to resolving the headset’s overall KDA issues was finding answers to the durability, flexibility, comfort, and color consistency problems that previous TPE and cloth materials had presented. With a drive toward investigating an alternative solution to TPE, SESA’s contract manufacturing partner selected them to provide essential technical support and develop custom formulated silicone materials to resolve these issues. Key materials were chosen to allow for insert molding, temperature resistance, pad printing, flexibility and color stability.

Ultimately, three (3) silicone LIMST™ products were selected from Shin-Etsu: KEG2000-70 for its stiffness, clarity and process-ability; KE1950-10 for its soft, cushiony feel; and KE2090-70 for its ability to bond to the PC/ABS headband during insert molding. Products of varying hardnesses were trialed until the flexibility and feel matched the desired requirements for the following KDAs:



BOOM: KEG2000-70 LIMS™

Problem — More flexibility and durability were needed for the intense activity of in-game use as scrap material was coming out of the seals. Additionally, the boom showed distinctive discoloration.

Solution— Specifically, the KEG2000-70 material was selected for its flexibility and durability which is needed for the intense requirements of ‘in-game’ use. The lower viscosity of Silicone allowed for lower injection pressures compared to TPE which improved processing. Also, the clarity of the material allowed it to be pigmented to match the other metallic gray components. A flex spring-steel wire was also inserted for easy assembly and “bendability”.



TEMPLE PAD: KE1950-10 – Low-Durometer LIMS™

Problem — A small, soft cushion was required to rest on the user’s temple area opposite of the vinyl/foam ear cup of the MONO unit headsets.

Solution — The KE1950-10 provided a soft (10 Shore A) cushion that was comfortable to wear throughout the 3+ hour games, and maintained its soft feel even at sub-zero temperatures.

HEADBAND: KE2090-70 Select-Hesive™ LIMS™

Problem – The black headbands required an elastic material that would retain its shape, feel, and color over the lifetime of the headset, and also chemically bond to the PC/ABS slider inserts during the molding process.

Solution – The KE2090-70 series product was instrumental to the ergonomic improvements of the new football coach’s headset design for its ability to aggressively bond to the PC/ABS headband substrate during insert overmolding with no primer or pre-treatment. The material is also naturally translucent so it was able to be readily pigmented.

COLOR/PAINT:

Problem — The original paint-on-plastic of the logo was faded, scratched and didn’t match from side-to-side and lock-to-lock areas. Maintaining uniformity of color is essential in maximizing the branding exposure of potential logos throughout a football broadcast season.

Solution — Shin-Etsu’s technical engineering team specified a silicone ink to pad print a logo on the silicone headband. The silicone ink provided the same flexibility and all-season durability as the silicone rubber. Shin-Etsu also recommended the silicone pad printing source, who was able to provide the silicone pad printing solution (vs. normal pad printing) within the short timeline requirements.

SPECIAL INSERT MOLDING PROCESSES:

A major manufacturing challenge for the “design-on-the-fly” team was the fact that three style versions of headsets were produced (Over-the-head-Mono/Dual/Behind-the-Head) utilizing entirely different components, and a headband that had sheet metal and wires insert molded. The wire inserting could never have happened with polymer or TPE materials, as the heat would have melted the wire. This changed the entire design of the headband and eliminated the need to add a wire during assembly.

Additionally, the silicone was molded over a special flex cable to form the microphone boom. A hollow spring-steel wire was placed inside of the boom to provide ease-of-assembly and added flexibility; allowing it to bend easily and stay in position. The end result was a fastened boom that has the freedom to stretch and return to its original position—whereas the previous design delaminated when flexed. The main mechanical piece in the headband is also a hardened flex-steel band that is insert-molded.



CONCLUSION/RESULTS:

Finished prototypes were tested by the client's focus groups which analyzed the headsets' overall performance and feel. After passing these tests, the prototypes were then tested in competition during actual games. Positive feedback and minimal design changes were required after these "in-game" tests and the final design was approved by the client.

A football coach's headset is a critical piece of equipment to communicate with quarterbacks and other coaches; therefore, reducing exterior noise is critical. During a typical football game, multiple coaching staff members will wear headsets to command game plan action over multiple lines for the offensive and defensive assistants.

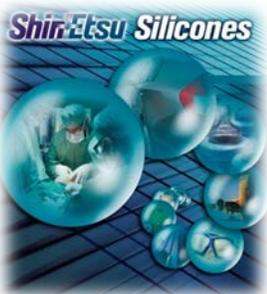
In addition to improving on ear comfort, acoustic sealing, and microphone-and-boom performance, the new ergonomic design offered a 'behind head' style which allows coaches the ability to wear a variety of hats while using the headsets. Ultimately, the benefits of Shin-Etsu's LIMS series material helped maximize today's football coach's in-game communication capabilities via a lighter, thinner, more durable and ergonomically advanced headset.

Shin-Etsu's LIMS series products have unique properties that are designed to take full advantage of and complement the latest developments in molding equipment and tooling technology across a myriad of applications—including football coaches' headsets. Leveraging the unique properties of specific LIMS products allowed the design partners to maximize efficiencies and achieve their desired ergonomic goals for the new headset.

In reference to the use of the KE2090-70 Select-Hesive™ LIMS product in the design, SESA's North American Marketing Manager, Eric Bishop, noted, "Ultimately, the primary benefit that the KE2090 series provides designers and molders is the means to manufacture a bi-material component in a fully automated manner by eliminating the need for hazardous priming, inconvenient pre-treatments, and costly secondary assembly operations. This technology enhances product design, improves performance, and increases productivity."

Bishop concluded in stating, "The goal is to expand the series' primer-less adhesion benefits to a wider range of applications—like the football coach's headset. We're seeing an increased demand for softer silicones and the ability to bond to higher temperature thermoplastic resins."

For more detailed information, visit the Shin-Etsu Silicones web site at:
www.shinetsusilicones.com



CORPORATE PROFILE: A U.S. subsidiary of Shin-Etsu Chemical Co. Ltd., Japan, Shin-Etsu Silicones of America Inc. offers vast technical and capital resources to formulate solutions as a major supplier of silicone materials to North America's medical, automotive, electronics, aerospace, cosmetics, and manufacturing industries. Shin-Etsu's premium silicone compounds incorporate leading-edge technology, staff expertise, and value-added service; offering customers the highest levels of quality and consistency in specialty silicone materials.

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