

FOR IMMEDIATE RELEASE

FOR: GLS CORPORATION
833 Ridgeview Drive
McHenry, IL 60050-7050

EDITORIAL CONTACT: MARTIN THOMAS, INC.
Martin K. Pottle, APR
(401) 245-8500

SUPER STRONG CASE FINDS ALL WEATHER MATERIAL

GLS TPEs Seals PDA Touch Screen and Keeps Water Out

FT. COLLINS, CO - The Personal Digital Assistant (PDA) has put schedules, rolodexes, data retrieval and note taking, even Internet capability literally in the palms of millions of the users, thereby creating a huge new market of small handheld electronics. Originally designed for the consumer market and indoor business environments, the PDA had been limited to the climate-controlled professionals. But no longer. Enter Ft. Collins, CO company Otter Products, LLC, and their proprietary line of tough armored case solutions. The PDA can now be used in less than ideal conditions, with assurances that it is crush-resistant, waterproof and even floats. In creating this ultra-tough case, Otter partnered with Thermoplastic Elastomer (TPE) manufacturer GLS Corporation of McHenry, IL to solve challenging materials and design problems to get the Heavy Armor 2600 PDA case to market.

Universal Fit

As Otter approached the PDA case project, they first had to consider the question of universality. There are lots of PDAs on the market, and no two are exactly the same size. Otter pressed forward, defining needs about overall size, screen size, versatility and connectivity of features as they compiled exhaustive R&D data on PDA specs and functions. At the crux of these

investigations was the question of the touch screen. Here again, designs varied and how to approach this vital function of both the case and the PDA presented a puzzling question. With lots of time and R&D resources sunk into the design phase of the project, answers became clear and prototype case designs were rendered. Although promising, the designers knew that the materials of the case and specifically the new TPEs (thermoplastic elastomers) from GLS Corporation would determine the success of the project as much as the final design.

Rugged-izing the PDA

In addition to the above challenges, Otter's engineers had several goals in mind for the Heavy Armor line of PDA cases. First, they wanted the case to be completely crush-proof, and allow users to access their PDA as if it wasn't inside an armored box so that the case/ PDA interface was completely transparent. And when the designers were talking about using the PDA, they meant as if the device was naked in the user's hand, with fully functionality of the infrared "beaming" capability that allows users to send data to one another, wirelessly. Second, Otter's engineers wanted to make the case completely waterproof and float by retaining just enough air inside the case to float even with the PDA inside it. Lastly, the design team desired an airtight design, that would lock out humidity and prevent any interior condensation of the PDA touch screen. It followed that rugged TPEs from GLS seemed the likely candidate to meet these needs.

Otter Products presented their materials partners (among them GLS Corporation) with a long list of challenges to rugged-ize the conventional PDA, which is a huge task as the PDA itself is known for being small and light but not for impact resistance, and is definitely not designed for complete immersion in water. Additionally, Otter planned to market the Heavy Armor line to discerning users, whose in-the-field applications would test the product well beyond conventional limits. Specifically, the company planned to introduce the new product to military, airline, automotive, hunting, industrial, construction and emergency services users who arguably represent the most demanding and product-punishing group of users in the world. Thus, it was

imperative that the design be virtually indestructible. To meet these challenges, Otter turned to their materials partners for answers. Due to the stringent design parameters and the high stress application that the case was designed to operate in, lots of materials testing and R&D time were invested to make the design work.

Touch Screen Compatible

If the exceptionally rugged fiberglass reinforced ABS plastics and polycarbonate materials of the case are the brawn, the “brains” of the design is making the case touch screen compatible and waterproof. PDAs are reliant on the stylus touching the LCD display pad to control the functions of the device, and when placed inside another shell with a membrane over the usually exposed tablet face, engineers faced a big design hurdle to get this to work. With more design time and R&D lab testing, the engineers were able to devise a way to get this to work. Ultimately, Otter has patented this process, which gives the company a unique design edge on “any kind of replaceable membrane for the touch screen device”. The touch screen breakthrough was made when engineers opted for a vacuum formed process to fabricate the membrane covering the screen-but the entire problem wasn’t solved by the manufacturing method alone. They still needed to make the case waterproof and air tight.

TPEs are Chosen

Otter turned to GLS Corporation to assist them in sourcing the proper materials for the vital and high stress touch screen area of the case. Long regarded for their line of versatile and colorable TPEs, GLS has assisted many product designers with difficult application challenges ranging from infant products to crafting tools. GLS was asked to come up with not just a TPE, but a special TPE “alloy” that could adhere to a very hard substrate while simultaneously holding the vacuum formed membrane in place, offering the case a completely sealed overmold that was grippy and very rugged.

Sticking to Substrates

The materials challenge was two-fold, so GLS approached the adhesion question first. In 2002, GLS TPEs underwent tests in laboratory conditions by an independent research company. Researchers compiled all the major TPE brands on the marketplace and gathered unbiased data on each of their individual overmolding adhesion characteristics, and rated the respective brands based on their adhesion strength. GLS TPEs came out on top of that test, especially when applied to very hard substrates like PC/ ABS with fiberglass reinforcement fibers. In initial molding runs, Otter's engineers had a great deal of trouble achieving the necessary overmolding characteristics needed for the TPEs to perform optimally in conjunction with the PC/ABS substrate. After testing and failing with a number of competing TPEs, GLS sent Otter a sample of VERSOLLAN OM1262NX TPEs. As promised, this grade stubbornly adhered to substrate.

Versollan OM1262 NX is a TPE grade that GLS developed specifically for overmolding applications to polycarbonate, ABS, and PC/ABS applications. With a Shore A hardness of 65 A and a tensile strength of 1840 PSI, this material was created for harsh and demanding applications where scuff resistance and a soft, grippy feel are vital characteristics. To make the TPE alloy super durable, GLS designed this TPE grade with a very high tear strength of 230 PSI.

Secondly, and of equal importance, was utilizing the TPEs to support the vacuum formed touch screen to make the case both waterproof and airtight. Using the firm's Solid Works engineering program, Otter and GLS were able to see in 3-dimension form the prototyping options that could meet these challenges. (After some design revisions and researching these options that would make the overmolding and vacuum forming processes cooperate in production, designers chose to undercut the vacuum formed touch screen into the TPE, this affected the rugged water resistant and grippy characteristics of the TPE materials for the user on the outside of the case while simultaneously maintaining a strong overmolding adhesion to the substrate.) Additionally,

GLS/OTTER - Personal Digital Assistant...continued
Page 5

Otter representatives were pleased with GLS TPEs because they offered the proper durometer, tactile feel, and seal surface that they desired for the end product.

Case Testing

Making a PDA case that can float, go underwater, and seal out all the elements requires stringent testing. To meet military certifications, the Heavy Armor case was subjected to a series of comprehensive tests, like being submerged to 3 meters and staying there for a duration of time. In fact, Otter's design team engineered the PDA case so that it has 3 different sealing surfaces and utilizes the GLS Corporation Versollan OM grade for two of these.

The testing phase was so successful that the Heavy Armor 2600 Case met military specifications in three categories; the impact resistance to drop test, where "no damage, except for slight cosmetic damage such as small dents or scuff marks, was observed", the water infiltration resistance test where testers noted "cases were tested with a simulated PDA in place, no water leakage as observed in any of the cases tested", and the dust resistance test, where lab representatives noted that "no evidence of dust penetration into the interior of the case was observed". The tests were performed independently by Boulder, CO-based Hauser Laboratories from June 20 through July 1, 2002. Hauser Laboratories is a division of Microbac Laboratories, Inc.

Otter Product's Kurt Richardson notes that the case design is so rugged and waterproof that Navy SEALs use the case while submerged in pools during training exercises to "beam" information back and forth underwater.

Launching the Product

Otter Products was able to roll out the Heavy Armor 2600 PDA case in just 8 months - from design conception to product launch. Otter manufactures products in Denver, CO and in Asia,

GLS/OTTER - Personal Digital Assistant...continued

Page 6

and thanks to the cooperation of many people and suppliers plus insight from GLS Corporation (who has extensive Pacific Rim operations and resources), the project was successful both in function and in the marketplace. Company officials note that the case has sold very well; the PDA case market is doubling every year, and the number of PDAs available to consumers is keeping pace. Plus, with the introduction of the tablet style digital notebook, Otter is hard at work creating a design that works on the same principals of the Heavy Armor line. Otter was pleased with how well GLS was in specifying materials and working with complex mold forms and multiple molding processes during the product development phase of the project. In 2003, the product has been thoroughly field tested by professionals in the military, fire services, forest service, emergency services, motorcycle enthusiasts and even the United Parcel System. Each occupation brings different demands to the table, and the Heavy Armor case is stalwartly standing up to each of them. Deleted last sentence

GLS Corporation has supplied elastomeric raw materials to the industry since 1979. The company has produced application-specific, custom TPE compounds since 1984; in 2001, the firm formed a strategic alliance with TPR manufacturer DSM; later in 2002 with GE Plastics to market a new line of Softfx™ hard engineering resin/soft TPE overmold combinations;. Other products offered for molding and extrusion include KRATON® thermoplastic rubber compounds, DYNAFLEX® thermoplastic elastomer compounds, VERSAFLEX® TPE alloys, and new generation VERSALLOY® elastomer alloys, which exhibit enhanced performance properties. Applications are found in medical, sports and leisure, automotive, lawn and garden, appliance, kitchen tool, power tool, personal care and industrial markets, among others.

Further information on the Versollan line of TPEs sold through GLS can be obtained by writing: Marketing Department, GLS Corporation, 833 Ridgeview Drive, McHenry, IL 60050-7050. Telephone: (815) 385-8500 or (800) 457-8777. Fax: (815) 385-8533. E-mail: info@glscorp.com Web Site: www.glscorp.com

###

DYNAFLEX, VERSAFLEX and VERSALLOY are registered trademarks of GLS Corporation.
DYNAFLEX compounds contain KRATON Polymers.
KRATON is a trademark of KRATON Polymers U.S. LLC.
VERSALLOY is a DSM – GLS alliance product.
VERSOLLAN is a trademark of GLS Corporation.
Kraton is a registered trademark of Kraton LLC

GLS9904.91603