

Learning through light and color

LiteScout® supports the developmental skills of visually impaired children with its luminous tokens made of ACRYLITE® molding compound

- **The therapeutic product trains the senses through play using light, colors and shapes**
- **Brand PMMA from Röhm is a compelling choice thanks to its high transparency and color intensity while being pleasant to the touch**
- **ACRYLITE® Softlight ensures soft, glare-free light and a matte surface**

With their luminous colors and rounded edges, the circles, triangles and squares made of ACRYLITE® molding compound are true eye catchers and invite little hands to touch and play with them. And this is precisely the intention, as they are designed to encourage the early development of children with visual impairments and multiple disabilities. They form part of the LiteScout® system, which consists of a light-up magnetic board, transparent tokens and a variety of learning games. Glare-free light, colors and contrasts promote children's residual visual function and improve their visual perception, hand-eye coordination and mental development.

Today, LiteScout® is an effective therapeutic learning tool used in 30 countries – and it's all thanks to a chance encounter between the plastics and lighting specialist Hagen Glass and a therapist for early visual development. The insight into her work inspired the owner of Plastolight to replace conventional light boxes using frosted glass and fluorescent tubes with modern light technology and lighter materials.

ACRYLITE® impresses with unsurpassed light-guiding properties

An automotive supplier advised Glass to use ACRYLITE®, as the brand PMMA from Röhm is also a proven material for lighting applications in vehicle construction. "The light transmittance and light-guiding properties of ACRYLITE® are simply unsurpassed. It is very easy to process and lightweight," comments Glass, listing the properties relevant to him. "In addition, all materials need to be safe for children and therefore free from harmful substances."

The name LiteScout®, a play on the words "light" and "lightweight," names two advantages of the therapeutic tool: Light stimulates visual perception, while lightweight refers directly to the fact that LiteScout® weighs much less than older light box designs. For therapists there is a very noticeable difference between carrying ten kilograms or just three when visiting the children they support.

ACRYLITE® Softlight for soft light and a matte effect

The very bright and homogeneously illuminated white surface is made of backlit ACRYLITE® sheet material, while the translucent colored tokens are made of a ACRYLITE® molding compound. Application engineers from Röhm's Molding Compounds business unit supported Glass and his LiteScout® project when it came to selecting the right molding compound and processor. They chose ACRYLITE® Softlight.

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Heinz Schubkegel, Senior Business Manager at the Molding Compounds business unit at Röhm, describes the special features of the product: “The molding compounds from this series offer finely graduated diffuser effects for homogeneous and glare-free light extraction. This makes them suitable for all kinds of lighting applications, including light covers, lenses and ambient lighting. When certain processing techniques are used, it is possible to create satin-matte or frosted surfaces. Moreover, the range of properties and ability to color the material mean that there’s a high degree of design freedom.”

To make the LiteScout® tokens, a colorless molding compound is transformed into vibrant colors using fluorescent pigments. “ACRYLITE® is ideal because we can use it to manufacture tokens with a matte finish that glow with an appealing soft light when placed on the luminous surface. All LiteScout® components need to be matte, as light reflections on reflective surfaces are irritating for people with visual impairments,” explains Glass.

Injection-molded and extruded tokens

Glass continuously improved the tool in close collaboration with therapists, educators and self-help groups, e.g., by improving the tokens’ thickness and their feel. Depending on the type of learning game in question, these are either injection-molded or extruded from Röhm’s PMMA molding compound.

For instance, a peg game trains the fine motor skills of blind and visually impaired children using five-centimeter-high blocks in triangle, square and circle shapes. To make these, two-meter-long profiles with a diameter of 2.5 centimeters are extruded and then cut and the contours milled and polished.

In contrast, the injection molding process is used to manufacture the “logic blocks” – flat geometric tokens for insertion according to color, shape and size into a black puzzle panel that is mounted on the lightbox’s luminous surface. With a depth of seven millimeters, they are now more than twice as thick as they were in a previous design, making it easier for children to grip them. To prevent the tokens slipping out of tiny hands, the injection molding die creates a grained surface structure. This is where the high reproduction accuracy of ACRYLITE® molding compounds really comes into its own. Finally, the gate marks are removed with a laser so that there is no risk of injury. “The result is a beautiful, high-quality product,” comments Glass. “The tokens feel good to touch, they are robust and they are scratch-resistant.”

Praise for design, function and effectiveness

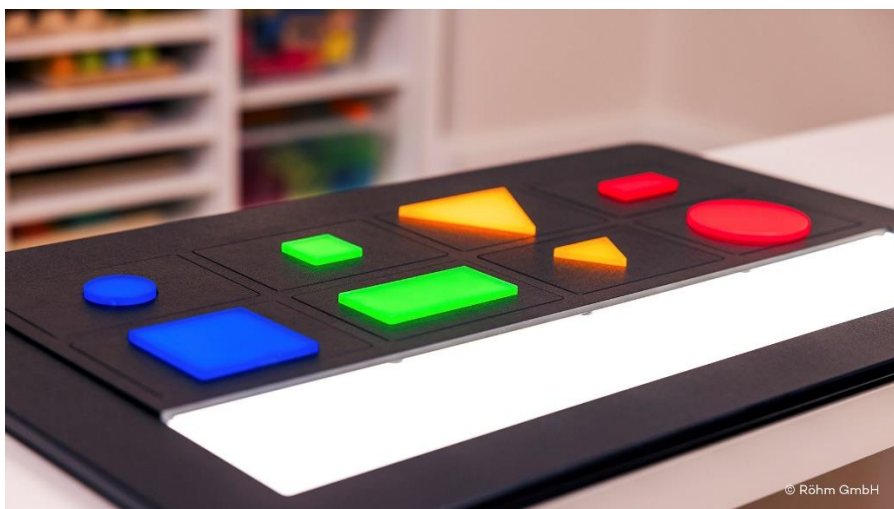
“ACRYLITE® appeals to nearly all of the senses – it has a high-quality appearance, is pleasant to the touch and even sounds good. It is an emotional product and is especially captivating when combined with light and color, sparking the curiosity of children and adults alike,” explains Siamak Djafarian, Senior Vice President Molding Compounds at Röhm. “We are delighted that our material and its properties are helping children with visual impairments to learn and is giving them joy.”

The design and function of the entire LiteScout® system are well received by specialists. Students at the Heidelberg University of Education used LiteScout® in a study on the “effectiveness of using light boxes for the promotion of visual perception” due to its “quality standards with regard to size, illuminants, light dimmability, stability and material durability.” The analysis revealed “clear learning effects” when high-quality light boxes were used in a targeted and individualized manner. “Children that practice with the LiteScout® system for

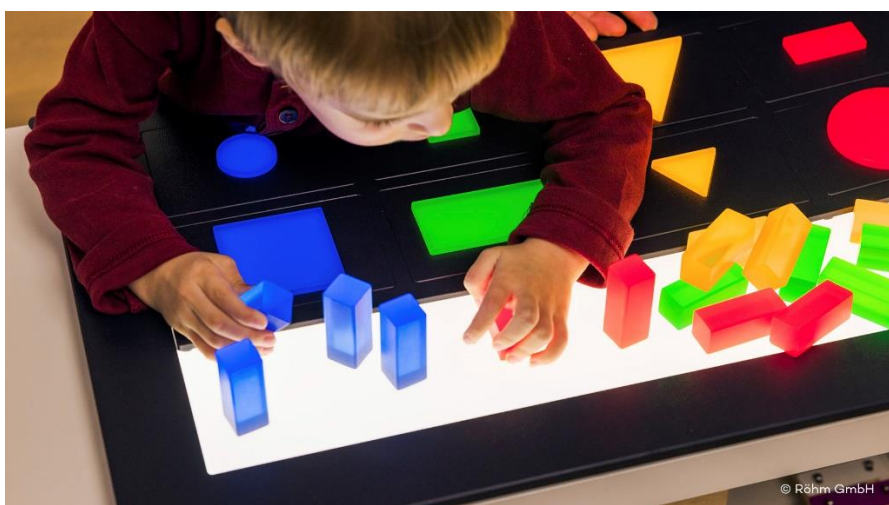
around half an hour daily make huge progress in their development,” reports Glass. For this reason, he is currently partnering with various early childhood development organizations to create a concept that will allow families of children with visual impairments and multiple disabilities to access rented devices for free.

For older target groups with visual impairments, classic games such as nine men’s morris, checkers, backgammon and ludo are to be developed for LiteScout® for use in retirement homes, for instance. Hagen Glass will again turn to the proven ACRYLITE® molding compound to make the luminous, colored LiteScout® game pieces and dice.

[Images]



The magnetic LiteScout® lightbox is an effective therapeutic tool for supporting the early development of children with visual impairments and multiple disabilities. The colored, translucent tokens are made of diffuse, light-scattering ACRYLITE® Softlight and are manufactured using the injection molding process.



LiteScout® peg game with extruded, five-centimeter-thick blocks in triangle, square and circle shapes made of ACRYLITE® Softlight. The vibrant luminous blocks captivate the senses and promote the recognition of shapes and colors.



LiteScout® with logic blocks: The geometric tokens made of ACRYLITE® Softlight must be inserted into the correct cut-out in the puzzle panel.

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About Röhm

Röhm is one of the world's leading manufacturers in the field of methacrylate chemistry and supplies customers in fast-growing markets including the automotive, construction, and medical technology industries. We serve a global market with our MERACRYL® methacrylates and PMMA molding compounds under the ACRYLITE® brand, which we manufacture in our worldwide production network. Our high-quality products offer a wide range of applications – from paints, coatings, car taillights, medical products, aircraft glazing and household appliance displays to road markings.

Around 2,900 employees worldwide play a part in our success. With production and research sites across Europe, North America, and China, we combine regional presence with global expertise and create added value for our customers.

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