Case Study

Patented DuPont Technology Provides Portable Speaker Components with Soft Touch and Durability

Logitech Ultimate Ears BOOM 3 portable speaker

Project

DuPont researchers collaborated with Logitech product designers to create soft-touch portable speaker components for the Ultimate Ears BOOM wireless speaker—including the strap, end covers, and volume control. They feel soft to the touch, but the components are durable enough to take music anywhere–from poolside parties to mountain climbing adventures.

Challenges

Durability

The portability of Ultimate Ears BOOM speakers means they require excellent abrasion resistance, strength to weather various environments, UV stability, and chemical resistance to avoid stains.

Color Matching

The solution had to allow customization of trending colors that best fit the product's design and match other speaker components.

Processability

Logitech needed a product that would provide easy overmolding and strong bonding to the BOOM's ABS (acrylonitrile butadiene styrene) frame for ease of assembly.

Solution

DuPont's thermoplastic elastomers provide the luxurious feel and durability needed for the Ultimate Ears BOOM speaker. DuPont™ TPSiV® creates speaker components that feel luxuriously soft, provide durability, and can be customized to Logitech's color palette. The finish is both silky and non-tacky (dirt and oil resistant), delivering exceptional aesthetics along with performance.

Exclusive DuPont Technology

TPSiV® elastomers are produced using proprietary DuPont technology to disperse finely divided particles of crosslinked silicone rubber in a matrix of thermoplastic urethane. As a result, these materials combine the softness of silicone with the toughness of TPU (thermoplastic polyurethane).

Sustainability

TPSiV® products incorporate vulcanized silicone in a thermoplastic matrix. But unlike traditional silicone rubber or surface coated elastomers, they can be recycled and reused in the manufacturing process. This makes TPSiV® products remarkably versatile and reliable for a range of applications. Longer life of the parts is achieved thanks to UV resistance, scratch resistance, and waterproofing. Waterproofing also makes the product safer.

Use of TPSiV® contributes to UN Sustainable Development Goals to ensure sustainable consumption and production patterns. Specifically, TPSiV® helps meet UN Goal 12.5 to substantially reduce waste generation through prevention, reduction, recycling, and reuse by 2030.

Results

For the Ultimate Ears BOOM speaker, TPSiV® 4000-75A SR thermoplastic elastomer combines a soft, silky feeling with excellent durability for wear, abrasion, and contact with skin oils and perspiration. The combination of polyurethane and silicone rubber provides surface resistance, lower coefficient of friction, and improved temperature properties. Plus, recyclable thermoplastic helps Logitech reduce waste and meet sustainability goals.

TPSiV® Key Properties

Test [1]	Property	Unit	TPSiV® 4000-75A SR Thermoplastic Elastomer
ISO 1183	Specific Gravity	g/cm3	1.1
ISO 868	Hardness	Shore A	77.00
MULTIBASE™	Mold Shrinkage	%	1.00-3.00
ISO 1133	Melt Flow Index (MFI, 10 kg 190°C)	g/10 min	26.00
ISO 37	Tensile Strength	MPa	15.8
ISO 37	Tensile Strength, 100% Elongation	MPa	3.9
ISO 37	Elongation at Break	%	630
ASTM D3389	Taber Abrasion	Mg/1,000 rev	40.00
ISO 34	Tear Strength	kN/m	64
ISO 178	Flexural Modulus	MPa	36
ISO 815	Compression Set, 22 Hours at 23°C	%	19.00
ISO 815	Compression Set, 22 Hours at 70°C	%	70.00
ISO 11359	CLTE	µm/m°C	230.00
PV3929	500h UV ΔE	ΔE	1.5

[1] ISO: International Standardization Organization; ASTM: American Society for Testing and Materials
[2] UV weathering test details available upon request.
Source: DuPont

The Versatility of TPSiV®

TPSiV® is ideal for any application where product designers seek to combine a non-slip, silky feeling with durability when exposed to skin oils and perspiration. Applications include, but are not limited to:

- Earbuds
- Smartphones
- Wearables
- Accessory cases
- Laptops/notebooks
- Portable speakers
- Medical data input devices

TPSiV® elastomer products can be manufactured using standard thermoplastic manufacturing processes, including overmolding or co-molding with plastic substrates such as polycarbonate, ABS, and nylons.

The extremely silky feel of TPSiV® elastomers does not require additional processing or coating steps.

Customized TPSiV® can be formulated to meet your requirements for:

- Hardness
- Mechanical strength
- Low compression set
- UV resistance
- Hydrolytic resistance
- Abrasion resistance
- Chemical resistance
- Color stability
- Color specifications, including light tints

Patented TPSiV® materials are only available from DuPont.

dupont.com/mobility-materials

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