

DuPont™ TPSiV® 4000-60A GFR Resists Gas Fading On Consumer Devices



Consumer handheld and wearable devices are booming: from game controllers, augmented/virtual reality equipment and headsets to speakers, phones, and tablets. As use of such devices grows more intense and frequent, so does their exposure to harsh environments. Contact with atmosphere pollutants and UV light, combined with careless storage and weathering, can result in premature aging and wear. Devices require more durability in the face of harmful conditions than ever before.

The Gas Fading Challenge

Gas fading is a discoloration concern for the soft-touch parts of consumer electronics. It occurs when low levels of a chemically active substance in a polymer reacts with nitrogen oxides (NOx) present in the surrounding environment. The reaction results in irreversible and drastic color changes. It can occur at any stage of the polymer's life cycle—from base resin storage to the hands of the end user. When consumers see the altered appearance of their device, they're more likely to replace it prematurely—leading to unnecessary waste.



Solution

DuPont has enhanced its TPSiV® product portfolio to better control and reduce the risk of discoloration due to gas fading. Innovative research involved deep analysis of additive interactions and a reorientation of raw material selection. The result: TPSiV® 4000-60A GFR, a new recipe that combats discoloration all while maintaining thermal and UV stability for ultimate protection. This achievement provides a new standard in durability and colorfastness for soft-touch consumer electronic parts.

About

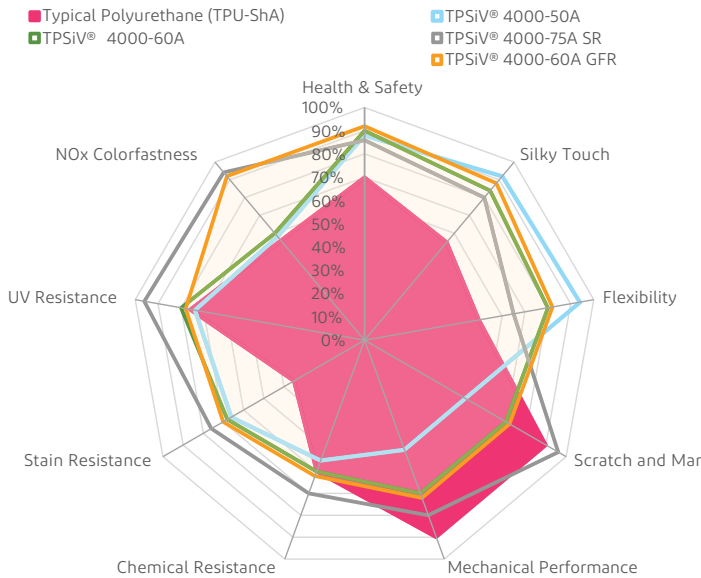
TPSiV® 4000-60A GFR

TPSiV® 4000-60A GFR is a soft elastomer designed to maintain color stability within the harshest environments. It offers a lasting defense against the distinct causes of gas fading, including NOx gas-based atmosphere pollutants and direct UV exposure

Key Advantages of TPSiV® 4000-60A GFR

- Appealing aesthetics, haptics, silky touch, and colorability
- Excellent UV stability
- Superior abrasion and scratch resistance
- Strong bonding with polycarbonate or any polar substrates

General Performance Overview



Source: DuPont

Unique Properties

TPSiV® 4000-60A GFR matches the robustness and aesthetics of pure silicone rubbers with ready-to-use advantages:

- Melt-processable through conventional injection molding
- Can be combined with other plastic resins
- No post-treatment, surface preparation, coatings, or additives needed

Plus, TPSiV® 4000-60A leads in sustainability with a less energy intensive transformation process and recyclability.

Gas Fading Resistance Outlook



TPSiV® 4000-60A
GFR ΔE* 2.7

TPSiV® 4000-60A
Original ΔE* 5.2

Typical TPU
ΔE* > 40

Product Comparison

	4000-60A 'GFR' 4000-60A Typical TPU*				
General Mechanical Properties	Standard	Unit			
Shore A hardness	ISO 7619-1	Shore A	63	62	89
Melt mass-flow rate	ISO 1133	g/10min	11	7	25
Density	ISO R1183	g/cm ³	1.09	1.11	1.10
Compression set 24h/23°C	ISO 815	%	28	33	23
Tensile strength at 100% - transversal	ISO 527-1-2	MPa	2.3	2.2	6.4
Tensile strength at break - transversal	ISO 527-1-2	MPa	7.6	5.2	30
Strain at break - transversal		%	640%	600%	760%
Tear strength - transversal	ISO 34-1	kN/m	35	30	105
Gas Fading Resistance - Burnt gas color fastness (color change observation)					
ΔL* - (negative: darker)			-0.7	-2.27	-20.3
Δa* - (positive: reddish)	AATCC TM23		0.3	3.7	34.9
Δb* - (positive: yellowish)	ISO 105-G02		2.6	2.4	22.7
ΔE* - (overall change)			2.7	5.2	>40

Source: DuPont

*Measured according to Multibase™ test standard

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Electrical and Electronics

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