APPLICATION DATA

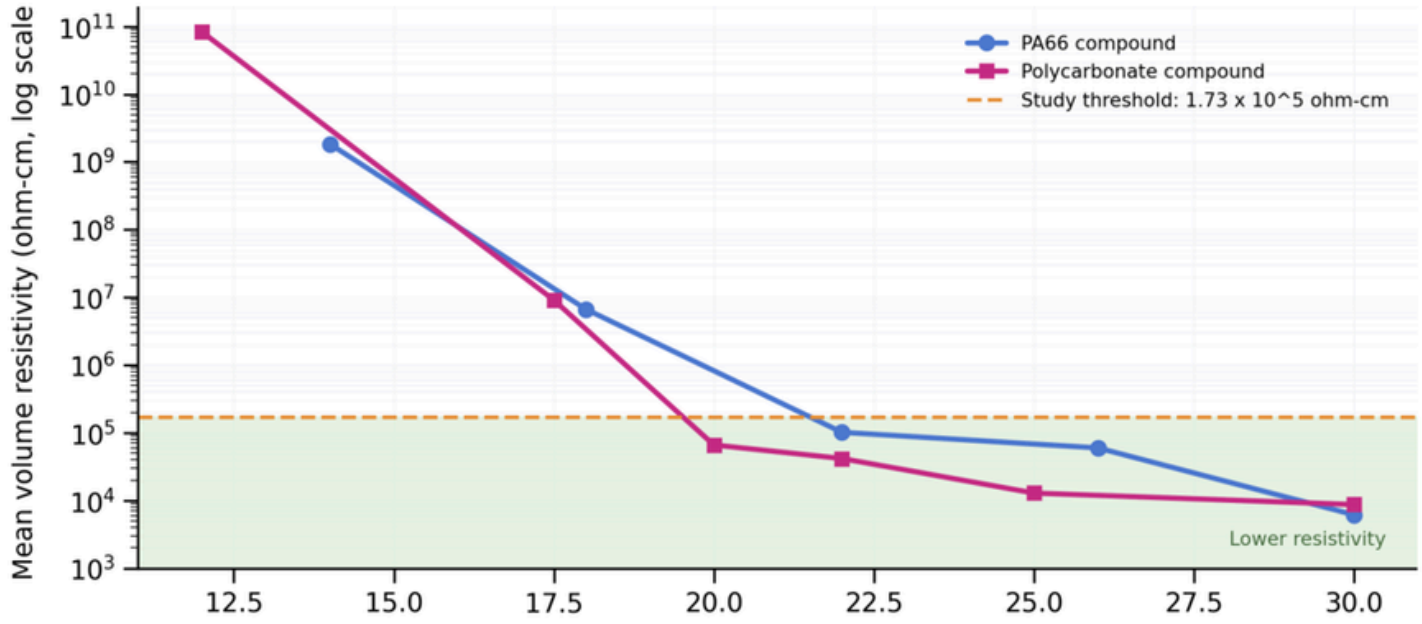
ZOLTEK™ PX35 CHOPPED FIBER (TYPE-45) ELECTRICAL CONDUCTIVITY IN PA66 AND PC

DESCRIPTION

ZOLTEK PX35 Type-45 chopped carbon fiber provides a practical route to lower electrical resistivity in engineering thermoplastic compounds. This study evaluated bulk volume resistivity across multiple carbon-fiber loading levels in polyamide-66 (PA66) and polycarbonate (PC).

STUDY FINDINGS

LOWER RESISTIVITY	PERCOLATION RANGE	MATRIX EFFECT
Mean volume resistivity decreased by several orders of magnitude as Type-45 loading increased.	The change from insulating to conductive behavior occurred across a loading range rather than at one universal loading.	Loading-response behavior differed between PA66 and PC, showing the importance of matrix and processing conditions.



WHAT THE STUDY SHOWED

PA66: percolation onset was identified around 16 wt%; mean resistivity continued to decrease through 30 wt%.
PC: percolation onset was identified around 17.5 wt%; the response became comparatively stable near 25 wt% under the tested conditions.

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TEST RESULTS AND MATERIAL INFORMATION

MEAN VOLUME RESISTIVITY RESULTS

Reported means are based on the available measurements at each loading level. Lower values indicate higher conductivity.

PA66 Loading	Mean Resistivity	n
14 wt%	1.84 x 10^9	40
18 wt%	6.68 x 10^6	40
22 wt%	1.02 x 10^5	40
26 wt%	5.98 x 10^4	40
30 wt%	6.16 x 10^3	40

PC Loading	Mean Resistivity	n
12 wt%	1.84 x 10^9	30
17.5 wt%	6.68 x 10^6	28
20 wt%	1.02 x 10^5	12
22 wt%	5.98 x 10^4	26
25 wt%	6.16 x 10^3	28
30 wt%	8.71 x 10^3	30

TEST FRAMEWORK

- Bulk resistivity methodology adapted from ASTM D257.
- Sample conditioning adapted from ASTM D6054-97.
- PA66 data set: 14, 18, 22, 26 and 30 wt% Type-45 loading.
- PC data set: 12, 17.5, 20, 22, 25 and 30 wt% Type-45 loading.
- Study chart uses a 1.73 x 10^5 ohm-cm screening threshold.
- Results reflect the evaluated compounds, specimens and test conditions.

TYPE-45 MATERIAL OVERVIEW

Recommended use: Engineering thermoplastics: PC, PA, POM and PBT/PET
Nominal fiber length: 6 mm (0.25 in)
Typical applications: RFI/EMI shielding, wear resistance, lightweight and dimensionally stable parts
Key characteristics: High strength and modulus, low density, electrical conductivity, low thermal expansion

IMPORTANT USE NOTE

The values shown are application-study results and do not constitute a product specification, warranty or guarantee. Final electrical performance depends on resin system, compounding and molding conditions, retained fiber length, dispersion, orientation, moisture and part geometry. Customers should validate performance in the intended formulation and component.

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