

HDPE-Graphene Masterbatch

AROS MB[®] HDPE - IM

AROS MB[®] HDPE - IM from Graphmatech is a masterbatch (i.e. ready-to-use granular mix) enhanced by our own unique and tailored Aros Graphene[®] Technology. The masterbatch is part of the AROSMB product range that embodies Graphmatech's expertise in Polymer Graphene Composites. AROS MB HDPE - IM is highly compatible with most standard high-density polyethylene (HDPE) grades available off-the-shelf and can serve as a perfect substitute for common carbon black masterbatches as it will retain the color black while increasing the final properties of the part.

Graphene is well known to have better physical and mechanical properties than traditional carbon black, so adding AROS MB HDPE - IM into your base polymer will have a major influence on the final gas barrier properties, electrical properties and thermal properties. AROS MB HDPE - IM solves the issues with re-agglomeration and non-homogenous dispersion common to traditional graphene solutions and thus eliminates the need for elaborate compounding.



- ESD properties
- Excellent mechanical properties
- Compatible with most HDPE grades
- Can be supplied as a masterbatch or compound
- Suitable for injection moulding (IM) of parts requiring enhanced gas barrier and/or electrical properties
- Masterbatch MFR (190°C - 2,16 kg) = 0,1 g/10 min

PHYSICAL PROPERTIES - TYPICAL VALUES

Mechanical properties and heat-deflection temperature (HDT) measured on compression mold samples. Permeability measured on extruded sheets.

Values measured at 5% of masterbatch in HDPE

Properties	Test method	Unit	Values
H ₂ permeability	ASTM D3985 - 17	(mol.m ⁻¹ .s ⁻¹ .MPa ⁻¹)	2,0 x 10 ⁻⁹
CH ₄ permeability W	ASTM D3985 - 17	(mol.m ⁻¹ .s ⁻¹ .MPa ⁻¹)	6,3 x 10 ⁻¹⁰
O ₂ permeability	ASTM D3985 - 17	(mol.m ⁻¹ .s ⁻¹ .MPa ⁻¹)	8,2 x 10 ⁻¹⁰
Thermal conductivity	ISO 22007-7 At 27°C	W/m*K	0,31
Electrical resistivity	N/A	N/A	N/A
Melt mass flow rate	ISO 1131-1 190°C - 2,16 kg	g/10 min	1,61
HDT	ISO 75-1A	°C	45
Relative density	ISO 1183-1		0,9488
Izod impact	ISO 180/A	kJ/m2	17
Tensile modulus	ISO 527-2 10 mm/min	MPa	1045
Stress at yield	ISO 527-2 10 mm/min	MPa	21,4
Nominal strain at break	ISO 527-2 10mm/min	%	321

Values measured at 30% of masterbatch in HDPE

Properties	Test method	Unit	Values
H ₂ permeability	ASTM D3985 - 17	(mol.m ⁻¹ .s ⁻¹ .MPa ⁻¹)	1,9 x 10 ⁻⁹
CH ₄ permeability	ASTM D3985 - 17	(mol.m ⁻¹ .s ⁻¹ .MPa ⁻¹)	5,8 x 10 ⁻¹⁰
O ₂ permeability	ASTM D3985 - 17	(mol.m ⁻¹ .s ⁻¹ .MPa ⁻¹)	8,2 x 10 ⁻¹⁰
Thermal conductivity	ISO 22007-7 At 27°C	W/m*K	0,30
Electrical resistivity	ASTM D257	Ohm*cm	2,08 x 10 ³
Melt mass flow rate	ISO 1131-1 190°C - 2,16 kg	g/10 min	0,78
HDT	ISO 75-1A	°C	52
Relative density	ISO 1183-1		0,9595
Izod impact	ISO 180/A	kJ/m2	3,5
Tensile modulus	ISO 527-2 10 mm/min	MPa	1274
Stress at yield	ISO 527-2 10 mm/min	MPa	23,9
Nominal strain at break	ISO 527-2 10 mm/min	%	104

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PROCESSING RECOMMENDATIONS

Pre-treatment	Unit	Values
Drying temperature	°C	60
Drying time	Hr	4
Barrel temperature		50
Hopper	°C	180
Zone 1	°C	185
Zone 2	°C	190
Zone 3	°C	190-200
Zone 4	°C	190-205
Zone 5/ nozzle	°C	190-210
Mold temperature		
Mold	°C	30-80

RECOMMENDED DOSING

Gas permeability application: 3-5%

ESD application: 9-11%

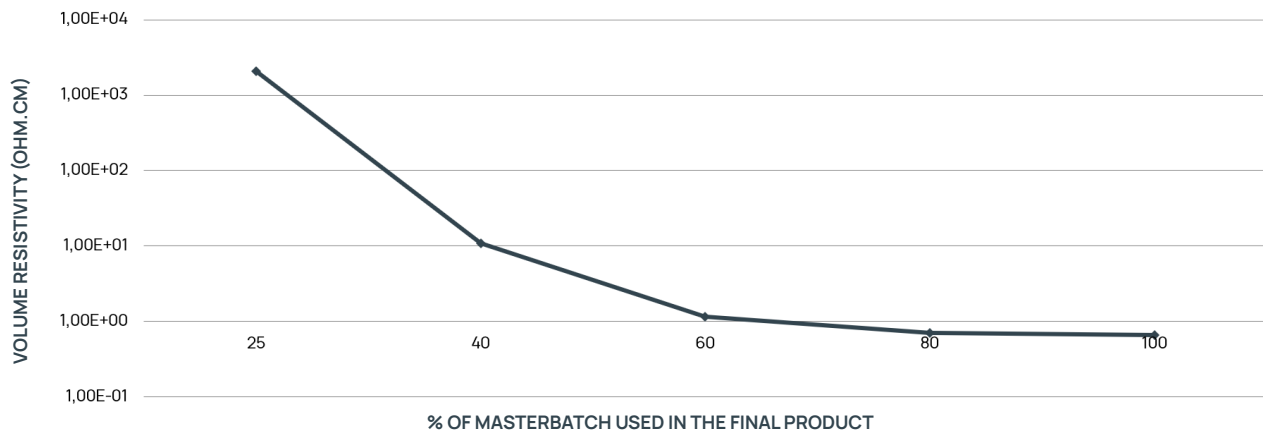
Electrical conductivity : 50% - 60%

FORMS OF SUPPLY

Shape	Pellets 3 mm
Category	Masterbatch
Packaging	1 kg and 5 kg aluminium sealed bag, contact us for larger quantities

VOLUME RESISTIVITY VS. % OF MASTERBATCH USED

Test method: ASTM D257



CONTACT GRAPHMATECH

Are you curious to learn more about AROS MB HDPE or a possible collaboration?

Contact our team at sales@graphmatech.com or visit our website Graphmatech.com

Aros Graphene[®] is a trademark held by Graphmatech AB

DISCLAIMER

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