

Graf+® Graphite Powder

TECHNICAL DATA SHEET 456

Product Overview

NeoGraf Solutions manufactures a variety of natural graphite powders under our Graf+® trade name. Graf+ powders can be added to a range of polymers to enhance thermal and electrical conductivity, reduce degradation to UV radiation, and increase insulation value in foams and boards. Graphite is also an excellent lubricant. Graf+ powders are available in a range of particle sizes and purities depending on the end-use application. High-purity (>99% carbon) grades are used in battery applications. NeoGraf graphite powders are available as dry powders, and can be compounded with polymers (masterbatches), as pastes with mineral oil and petrolatum, or as water-based dispersions/ solid lubricants.

Grade Designations

Particle Size D50 - Purity - Graphite Type

Graphite Type:

- Particle Size D50 varies from 4µm to 200µm

Purity:

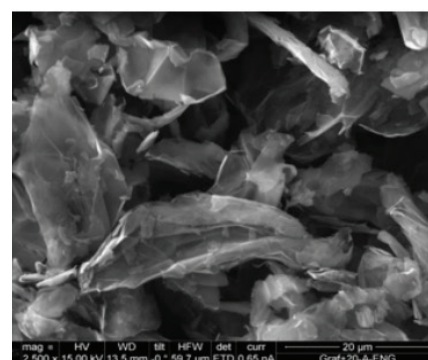
- (A) >99% Carbon
- (C) >95% Carbon

Graphite Type:

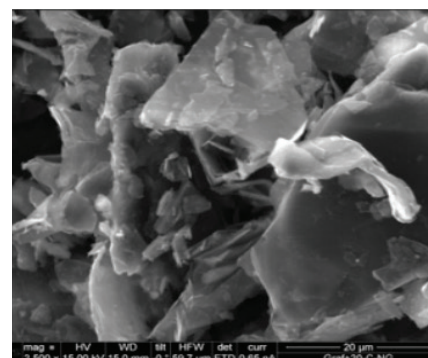
- Expanded Natural Graphite (ENG)
- Flake Natural Graphite (NG)

Example:

Graf+ 20-C-ENG denotes D50 20 µm, Purity > 95+% Carbon, Expanded Natural Graphite Material



EXPANDED NATURAL GRAPHITE



FLAKE NATURAL GRAPHITE

Expanded Natural Graphite Grades (ENG)

Expanded natural graphite (ENG) powders are made by intercalating natural graphite flakes with acids and then heating to drive off the intercalants to create an expanded or exfoliated graphite. The exfoliated graphite is subsequently milled. The main features of expanded graphite materials are their high surface area and low Scott density, resulting in a low percolation threshold and high compressibility. Purity levels are established at 95+% graphite as the purity is from the raw flake source. This purity level is suitable for industrial applications. End-use applications include extruded polystyrene (XPS) insulation boards, alkaline and lead acid batteries, fuel cells, specialty adhesives, conductive polymers, and ceramics. Customized high purity materials may be available for more demanding applications.

Typical Properties ^[1]

Property	Unit	Graf+ 10-C-ENG	Graf+ 20-C-ENG	Graf+ 40-C-ENG	Graf+ 100-C-ENG
Ash	%	<5	<5	<5	<5
Typical Particle Size					
D10	µm	5	7	15	20
D50	µm	10	20	40	100
D90	µm	27	47	100	180
Scott Density	g/ml	0.06	0.06	0.07	0.11
BET Surface Area	m ² /g	20	18	16	4
Moisture	%	<0.2	<0.2	<0.2	<0.2

Flake Natural Graphite Grades (NG)

Flake natural graphite powders are derived from naturally occurring flake deposits. The flake is milled between ~4-30 µm. The main features of flake natural graphite materials are lower surface area and higher Scott density. Purity levels vary depending on the starting flake purity from ~95% carbon to >99.9% carbon. End-use applications include expanded polystyrene (EPS) insulation boards, lubricants and greases, friction products, alkaline, lead acid, and Li-ion batteries, fuel cells, specialty adhesives, conductive polymers, and ceramics.

Typical Properties ^[1]

Property	Unit	Graf+ 10-C-NG	Graf+ 20-C-NG	Graf+ 40-C-NG	Graf+ 100-C-NG
Ash	%	<5	<5	<5	<5
Typical Particle Size					
D10	µm	2	10	13	38
D50	µm	8	33	44	125
D90	µm	25	89	118	271
Scott Density	g/ml	0.15	0.18	0.19	0.26
BET Surface Area	m ² /g	13	6.6	6	3.8
Moisture	%	<0.2	<0.2	<0.2	<0.2

Typical Properties ^[1]

Property	Unit	Graf+ 4-A-NG	Graf+ 10-A-NG	Graf+ 20-A-NG	Graf+ 40-A-NG
Ash	%	<1	<1	<1	<1
Typical Particle Size					
D10	µm	2.5	3.9	9.6	11.8
D50	µm	6.7	11.3	33.2	43
D90	µm	12	25	82	108
Scott Density	g/ml	0.21	0.15	0.18	0.19
BET Surface Area	m ² /g	16.6	12.2	5.8	5.9
Moisture	%	<0.2	<0.2	<0.2	<0.2

Graf+® Graphite Powders Masterbatches

Graf+ micronized graphite powders are also available in masterbatch form in a variety of polymers including PE, PP, Nylon, TPU, EMA, and many others containing between ~10-40 wt.% graphite solids. Please inquire about custom formulations. Liquid masterbatch dispersions in water and other solvents containing between 1-20 wt.% graphite solids are also available for customization. For more information on masterbatches, see [Graf-M™ Graphite Masterbatches](#)

Notes:

[1] Properties listed are typical and cannot be used as acceptance or rejection criteria. Customers are encouraged to test the products to ensure that they will meet the requirements of their application.

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All products are made in Lakewood, Ohio, USA

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