NeoNxGen®

NeoNxGen® Heat Spreaders

TECHNICAL DATA SHEET 600

Product Overview

The NeoNxGen® family of flexible graphite thermal management solutions offers high-performance, thick, flexible graphite material designed for the most demanding thermal management challenges in consumer electronics, medical, automotive, and energy storage applications. This advanced graphite heat spreader enables single-layer solutions that previously required multiple layers. NeoNxGen graphite can be die-cut or laminated with plastics or adhesives to create easy-to-install solutions.

NeoNxGen Products [1]

CHARACTERISTIC	N-280	N-500
Graphite Thicknesses (µm)	280±25	500 ±50
Sheet Size	265 mm x 405 mm	270mm x 420 mm
Roll Length (m)	Sheets Only	Sheets Only
Thermal Conductivity:		
In-Plane [2] (W/m·K)	1000	1000
Through-Plane [3] (W/m·K)	4.0	4.2
Graphite Finish	Gloss	Matte
Thermal Conductance [4] (mW/K)	280	500
Density (g/cm^3)	1.9	1.9
Electrical Resistivity In-Plane (10^{-4} Ωcm)		
In-Plane	2.4	2.3
Through-Plane	22000	13000
Electrical Conductivity:		
In-Plane (S/cm)	4400	4400
Through-Plane (S/m)	0.005	0.001
Meets NASA Outgassing Standards?[5]	Yes	Yes
RoHS/REACH Compliant?	Yes	Yes
Lead/Halogen-Free?	Yes	Yes
UL Flammability Rating (with or without standard PET/adhesive coatings)	94 V-0	94 V-0

General NeoNxGen Product Characteristics [1]

Coefficient of Thermal Expansion, In-Plane (ppm/°C)	-0.4
Coefficient of Thermal Expansion, Through-Plane (ppm/°C)	27.0
Specific Heat (J/g°C @ 50°C)	0.81
Operating Temperature:	
In any atmosphere with standard PET/adhesive coatings: long-term [6] (°C)	-30 to +140
In any atmosphere with standard PET/adhesive coatings: short-term [6] (°C)	-40 to +149
In an oxygen-containing atmosphere, without coatings (°C)	-250 to +400
In a reducing atmosphere, or vacuum, without coatings (°C)	-250 to +3000

Part Designation

Every NeoNxGen flexible graphite heat spreader part number specifies the material grade and coating options. It is constructed based on the example below. **For additional information on standard coatings, please refer to Technical Data Sheet 322 - SpreaderShield Design Options.**

NeoNxGen Graphite Heat Spreader		Plastic/Adhesive Coatings				Envelope Seal
N-280	--	P1	G	P1A1	--	EN
Product Grade (includes the thickness in µm)		**Top Coating Type** (if any)	**G Graphite**	**Bottom Coating Type** (if any)		**Envelope Seal Designation** (if used)

Notes:

[1] Properties listed are typical and cannot be used as acceptance or rejection criteria. Product characteristics are subject to change at any time without prior notice. Product characteristics exclude coatings and adhesives.

[2] In-plane thermal conductivity is determined by the 'NeoGraf Standard Method for Determination of Thermal Conductivity'.

[3] Through-plane thermal conductivity determined using ASTM D5470 method @ 600 kPa.

[4] Thermal conductance is defined as the thickness of the spreader times its thermal conductivity. It is an easy way to compare the spreading ability of two different products. The higher the number, the more heat the product will spread.

[5] Materials meeting outgassing requirements for spacecraft use must have a maximum total mass loss (TML) of 1.0 percent and a maximum collected volatile condensable material (CVCM) of 0.10 percent, as specified in ASTM E 595-77/84/90.

[6] Short-term refers to periods of minutes and hours. Long-term refers to periods of days and weeks.

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All products are made in Lakewood, Ohio, USA
+1 (800) 253.8003 (Toll-Free in USA) | +1 (216) 529.3777 (International)
www.neograf.com | info@neograf.com | www.neograf.com/ask-an-engineer

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