

SpreaderShield™ Heat Spreaders

TECHNICAL DATA SHEET 321

Product Overview

SpreaderShield™ flexible graphite products function as both a passive heat spreader and heat shield. These products offer a variety of in-plane thermal conductivity solutions. The flexible graphite materials can be die-cut, or laminated with plastics and/or adhesives.

Part Designation

Every SpreaderShield flexible graphite heat spreader part number defines the grade and coating options of the material. It is constructed based on the example below. [For additional coating information, please reference Technical Data Sheet 322 - SpreaderShield™ Design Options.](#)

SpreaderShield Product Series Characteristics: Natural Graphite Products ^[1]

CHARACTERISTIC	PRODUCT THICKNESS (mm)	SS350	SS400	SS500	SS600
Typical Thermal Conductivity ^[3] In-Plane • Through-Plane (W/m-K)		350 • 4.1	400 • 3.7	500 • 2.8	600 • 3.5
Thickness Capability Range ^[2] (mm)	1.0 ↑ ↓ 0.0	0.94 ↑ ↓ 0.127	0.94 ↑ ↓ 0.050	0.40 ↑ ↓ 0.076	0.127
Typical Roll Thickness ^[2] (mm) • Typical Roll Width (mm) Width of graphite material only, finished roll width will slightly decrease with coating and adhesive options	1.0 ↑ ↓ 0.0	0.94 • 610 0.48 • 610 0.20 • 610	0.94 • 610 0.51 • 584 0.25 • 584 0.127 • 610 0.050 • 355	0.40 • 508 0.20 • 457 0.127 • 440 0.076 • 400	0.127 • 305
Thermal Contact Impedance Per Side (°C cm ² /W) @ Specified Thickness (mm)		0.34 @ 0.51	0.38 @ 0.51	0.90 @ 0.102	0.44 @ 0.102
Tensile Strength (MPa)		-	9.7	7.7	9.7
Electrical Resistivity In-Plane (μΩm)		5.8	5.2	4.2	3.4
Electrical Conductivity In-Plane • Through-Plane (S/cm)		1,750 • 23	1,900 • 18	2,400 • 15	2,900 • 10

SpreaderShield Graphite Heat Spreader		Plastic/Adhesive Coatings			Envelope Seal		
SS400	—	0.25	P1	G	P1A1	—	EN
Product Grade		Graphite Layer Thickness in mm (excludes coatings)	Top Coating Type (if any)	G (graphite)	Bottom Coating Type (if any)		Envelope Seal Designation (if used)

SpreaderShield Product Grade Characteristics: Natural Graphite Products ^[1]

CHARACTERISTIC	SS350	SS400	SS500	SS600
Coefficient of Thermal Expansion (ppm/°C) In-Plane • Through-Plane	-0.4 • 27.0	-0.4 • 27.0	-0.4 • 27.0	-0.4 • 27.0
Specific Heat ^[4] (J/g°C) @ 50°C	0.81	0.81	0.81	0.81
Operating Temperature (°C)	-40 to +400	-40 to +400	-40 to +400	-40 to +400
UL Flammability Rating	94V-0	94V-0	94V-0	94V-0
RoHS Compliant	Yes	Yes	Yes	Yes
Lead / Halogen-Free	Yes	Yes	Yes	Yes

SpreaderShield Product Grade Characteristics: Synthetic Graphite Products ^[1]

CHARACTERISTIC	TG-826ACR	TG-827CR	TG-828CR	TG-829CR
Thickness (mm)	0.017 ±0.003	0.025 ±0.005	0.032 ±0.005	0.040 ±0.005
Typical Roll Dimensions Width (mm)	200	240	240	200
Typical Thermal Conductivity ^[3] (W/m-K) In-Plane • Through-Plane	1600 • 3.4	1500 • 3.4	1400 • 3.4	1350 • 3.4
Electrical Conductivity (S/cm) In-Plane • Through-Plane @0.025mm	19,000 • 5	19,000 • 5	19,000 • 5	19,000 • 5
Coefficient of Thermal Expansion (ppm/°C) In-Plane • Through-Plane	-0.4 • 27	-0.4 • 27	-0.4 • 27	-0.4 • 27
Operating Temperature (°C)	-40 to +400	-40 to +400	-40 to +400	-40 to +400
UL Flammability Rating	94V-0	94V-0	94V-0	94V-0
RoHS Compliant	Yes	Yes	Yes	Yes
Lead / Halogen-Free	Yes	Yes	Yes	Yes

Notes:

- [1] Properties listed are typical and cannot be used as acceptance or rejection criteria. Product characteristics exclude coatings and adhesives.
- [2] Thickness tolerance on natural graphite products up to and including 0.127mm nominal thickness: ±0.013mm; thickness tolerance on material nominal thickness greater than 0.127mm: ±0.025mm.
- [3] In-plane thermal conductivity determined by 'Neograf Standard Method for Determination of Thermal Conductivity'; through-plane thermal conductivity determined using ASTM D5470 Modified method.
- [4] Specific Heat determined by Quasi-Isothermal Modulated Differential Scanning Calorimetry Method.

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+1 (800) 253.8003 (Toll-Free in USA) | +1 (216) 529.3777 (International)
www.neograf.com | info@neograf.com

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