

SPREADERSHIELD™ Heat Spreaders

TECHNICAL DATA SHEET 321

Product Overview

eGRAF® 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 eGRAF® 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.](#)

Product Series Characteristics:^[1] Natural Graphite Products

CHARACTERISTIC	SS350	SS400	SS500	SS550	SS600
Typical Thermal Conductivity ^[3] In-Plane • Through-Plane (W/m-K)	350 • 4.1	400 • 3.7	500 • 2.8	550 • 3.7	600 • 3.5
Thickness Capability Range ^[2] (mm)	0.127 - 0.94	0.060 - 0.94	0.076 - 0.40	0.127	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	0.94 • 610 0.48 • 610 0.20 • 610	0.94 • 610 0.51 • 584 0.25 • 584 0.127 • 610 0.060 • 400	0.40 • 406 0.20 • 457 0.127 • 440 0.076 • 400	0.127 • 406	0.127 • 182
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	0.44 @ 0.102
Tensile Strength (MPa)	-	9.7	7.7	9.7	9.7
Electrical Resistivity In-Plane (μΩm)	5.8	5.2	4.2	3.4	3.4
Electrical Conductivity In-Plane • Through-Plane (S/cm)	1,750 • 23	1,900 • 18	2,400 • 15	2,900 • 10	2,900 • 10

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)

Product Grade Characteristics^[1]: Natural Graphite Products

CHARACTERISTIC	SS350	SS400	SS500	SS550	SS600
Coefficient of Thermal Expansion (ppm/°C) In-Plane • Through-Plane		-0.4 • 27.0			
Specific Heat ^[4] (J/g°C) @ 50°C		0.81			
Operating Temperature (°C)		-40 to +400			
UL Flammability Rating		94V-0			
RoHS Compliant		Yes			
Lead / Halogen Free		Yes			

Product Grade Characteristics^[1]: Synthetic Graphite Products

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	
Coefficient of Thermal Expansion (ppm/°C) In-Plane • Through-Plane			-0.4 • 27	
Operating Temperature (°C)			-40 to +400	
UL Flammability Rating			94V-0	
RoHS Compliant			Yes	
Lead / Halogen Free			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.

LEAD. CREATE. CONNECT.

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

©2021 NeoGraf Solutions, LLC (NGS). This information is based on data believed to be reliable, but NGS makes no warranties, express or implied, as to its accuracy and assumes no liability arising out of its use. The data listed falls within the normal range of product properties, but should not be used to establish specification limits or used alone as the basis of design. NGS's liability to purchasers is expressly limited to the terms and conditions of sale. eGRAF®, NeoNxGen™, SPREADERSHIELD™, HITHERM™, GRAFGUARD®, GRAFOIL®, GRAF+® and GrafHX® are registered trademarks of NeoGraf Solutions, LLC. eGRAF®, NeoNxGen™, SPREADERSHIELD™, HITHERM™, GRAFGUARD®, GRAFOIL®, GRAF+® and GrafHX® products, materials, and processes are covered by several US and foreign patents. For patent information visit www.neograf.com.