

# 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:<sup>[1]</sup> Natural Graphite Products

CHARACTERISTIC	SS300	SS350	SS400	SS500	SS600
Typical Thermal Conductivity <sup>[3]</sup> In-Plane • Through-Plane (W/m-K)	300 • 4.5	350 • 4.1	400 • 3.7	500 • 2.8	600 • 3.5
Thickness Capability Range <sup>[2]</sup> (mm)	0.51 - 0.94	0.127 - 0.94	0.040 - 0.94	0.076 - 0.76	0.102 - 0.127
Typical Roll Thickness <sup>[2]</sup> (mm) • Typical Roll Width (mm) Width of graphite material only, finished roll width will slightly decrease with coating and adhesive options	0.51 • 1000 0.94 • 610	0.20 • 610 0.48 • 610 0.94 • 610	0.040 • 355 0.051 • 355 0.076 • 559 0.127 • 610 0.25 • 584 0.51 • 584 0.94 • 610	0.076 • 400 0.127 • 440 0.20 • 457 0.40 • 508 0.76 • 305	0.102 • 182 0.127 • 182
Thermal Contact Impedance Per Side (°C cm <sup>2</sup> /W) @ specified thickness (mm)	0.30 @ 0.51	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)	6.5	5.8	5.2	4.2	3.4
Electrical Conductivity In-Plane • Through-Plane (S/cm)	1,600 • 28	1750 • 23	1,900 • 18	2,400 • 15	2,900 • 10

GRAPHITE HEAT SPREADER		PLASTIC/ADHESIVE COATINGS			ENVELOPE SEAL		
<b>SS400</b>	—	<b>0.25</b>	<b>P1</b>	<b>G</b>	<b>P1A1</b>	—	<b>EN</b>
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<sup>[1]</sup>: Natural Graphite Products**

CHARACTERISTIC	SS300	SS350	SS400	SS500	SS600
Coefficient of Thermal Expansion (ppm/°C) In-Plane • Through-Plane			-0.4 • 27.0		
Specific Heat <sup>[4]</sup> (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<sup>[1]</sup>: Synthetic Graphite Products**

CHARACTERISTIC	TG-826ACR	TG-827CR	TG-828CR	TG-829CR	TG-818
Thickness (mm)	0.017 ±0.003	0.025 ±0.005	0.032 ±0.005	0.040 ±0.005	0.050 ±0.010
Typical Roll Dimensions Width (mm)	200	200 240	200 240	200	248mm x 390mm
Typical Thermal Conductivity <sup>[3]</sup> (W/m-K) In-Plane • Through-Plane	1600 • 3.4	1500 • 3.4	1400 • 3.4	1350 • 3.4	1400 • 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.

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