

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	0.051 - 0.94	0.076 - 0.40	0.127	0.127
Typical Roll Thickness ^[2] (mm) • Typical Roll Width (mm)	0.20 • 610 0.48 • 610 0.94 • 610	0.051 • 355 0.127 • 610 0.25 • 584 0.51 • 584 0.94 • 610	0.076 • 400 0.127 • 440 0.20 • 457 0.40 • 508	0.127 • 406	0.127 • 182
Width of graphite material only, finished roll width will slightly decrease with coating and adhesive options					
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	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	240	240	200	248mm x 390mm
Typical Thermal Conductivity ^[3] (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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