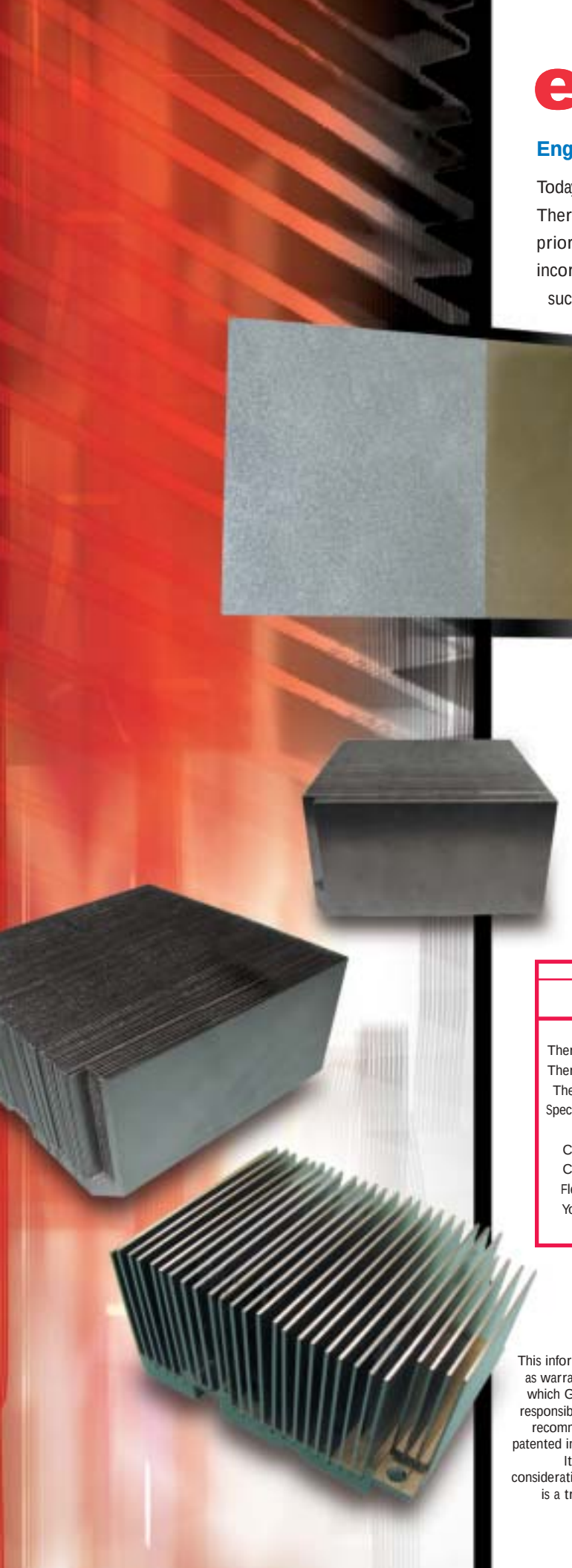
eGRAF™ HS-400

Heat Sink Technology

Engineered heat sink Technology for tomorrow's designs

Today's thermal design engineers are confronted with conflicting priorities! Improving Thermal performance without increasing weight. Trying to solve these conflicting priorities with traditional aluminum heat sink materials can lead to designs which incorporate such expensive options like copper fins and base plates, reliability issues such as heat pipes and additional fans. Graftech and eGRAF HS-400 materials can provide the answers to your tough design issues! eGRAF HS-400 material can address your thermal design issues and reduce the overall weight of the package. The in-plane thermal conductivity of HS-400 is approximately the same as copper. The unique properties of natural graphite also allow HS-400's thermal conductivity to be tailored to your specific design needs which can eliminate the need for heat pipes. Additionally, HS-400's density is typically 70% of aluminum and 22% of copper. Our Team of thermal design and CFD engineers can work with your product development group to exploit the benefits of our materials in your applications.



Summary of eGRAF HS-400 Advantages

- **Thermal conductivity which matches copper.**
- **Density is typically 70% of aluminum and 22% of copper..**
- **Thermal properties which are designed around your application.**
- **Designs which extend current fan/sink technologies to meet current and future design needs.**

eGRAF HS-400 advanced heat sink material versus typical aluminum and copper

Property	Units	Direction	Typical Value eGRAF HS-400	Typical Value Aluminum 6063 T6	Typical Value Copper C15710 0%
Density	g/cm3		1.94	2.70	8.82
Thermal Conductivity	W/mK	In-Plane	370	201	360
Thermal Conductivity	W/mK	Thickness	6.5	201	360
Thermal Anisotropy			57	1	1
Specific Heat Capacity	J/kgK		846	900	380
Resistivity	mohmm	In-Plane	6	0.053	0.018
Cte (30-100 ºC)	10-6m/m/ºC	In-Plane	-2.4	23.4	19.5
Cte (30-100 ºC)	10-6m/m/ºC	Thickness	54	23.4	19.5
Flexural Strength	MPa	In-Plane	70	214(YS)	270(YS)
Young's Modulus	GPa	In-Plane	42	68.3	105
Hardness	Rockwell R	In-Plane	96	73(HB)	60(HRB)

GT-201 (03/02)

GRAFTECH INC.
Heat Management Products
PO Box 94637, Cleveland, OH 44101-4637
Phone: (800) 253-8003 • Fax: (216) 529-3888
www.graftech.com • Email: etm@ucar.com