

Materials

Graphite

Although several physical forms occur only polycrystalline, pyrolytic, and vitreous graphite play a roll in semiconductor manufacturing. To form the most common of these types, polycrystalline graphite, raw material manufacturers blend, crush, and mill raw coke to sizes required for various bulk material properties. Once packed and pressed the raw coke billet is baked to form a carbon billet. The carbon billet is then graphitized in a high temperature environment to form a basic raw graphite form. The material can then be post processed to improve specific material characteristics such as surface hardness.

As with alumina oxide, graphite is available in many raw forms and grades of which the best are not readily specified by AMS, ASTM, or other associations generating material specifications. Electro-Graph supplies components from bare polycrystalline, pyrolytic infiltrated, solid pyrolytic, vitreous impregnated, and glassy (vitreous) coated graphite. In turn, each of these materials can be supplied in two-to-five basic grades that meet a broad range of applications within the semiconductor manufacturing environment. As a result, the raw material for each graphite component supplied by Electro-Graph is specified by the raw material grade and any required post process. Most graphite considered to be pure has less than 5ppm total ash. Listed below is a typical GDMS purity analysis for bulk polycrystalline graphite. Contact our [engineering staff](#) for a more detailed review of individual needs.

Element	[ppm wt]	Element	[ppm wt]	Element	[ppm wt]	Element	[ppm wt]
Li	< 0.01	Mn	< 0.001	Ag	< 0.05	Tm	< 0.01
Be	< 0.01	Fe	0.03	Cd	< 0.05	Yb	< 0.01
B	0.7	Co	0.008	In	< 0.1	Lu	< 0.01
C	MATRIX	Ni	0.01	Sn	< 0.05	Hf	< 0.01
N	NM	Cu	< 0.01	Sb	< 0.01	Ta	< 5
O	NM	Zn	< 0.05	Te	< 0.01	W	0.08
F	0.07	Ga	< 0.01	I	< 0.05	Re	< 0.05
Na	< 0.005	Ge	< 0.05	Cs	< 0.01	Os	< 0.01
Mg	< 0.005	As	< 0.01	Ba	< 0.01	Ir	< 0.01
Al	0.09	Se	< 0.01	La	< 0.01	Pt	< 0.1
Si	0.05	Br	< 0.01	Ce	< 0.01	Au	< 0.05
P	0.02	Rb	< 0.005	Pr	< 0.01	Hg	< 0.1
S	0.18	Sr	< 0.005	Nd	< 0.01	Tl	< 0.005
Cl	0.38	Y	< 0.005	Sm	< 0.01	Pb	< 0.01
K	< 0.05	Zr	< 0.005	Eu	< 0.01	Bi	< 0.01
Ca	< 0.05	Nb	< 0.005	Gd	< 0.01	Th	< 0.005
Sc	< 0.005	Mo	< 0.05	Tb	< 0.01	U	< 0.005
Ti	0.02	Ru	< 0.01	Dy	< 0.01		
V	0.002	Rh	< 0.005	Ho	< 0.01		
Cr	0.18	Pd	< 0.01	Er	< 0.01		

Total 1.82

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