



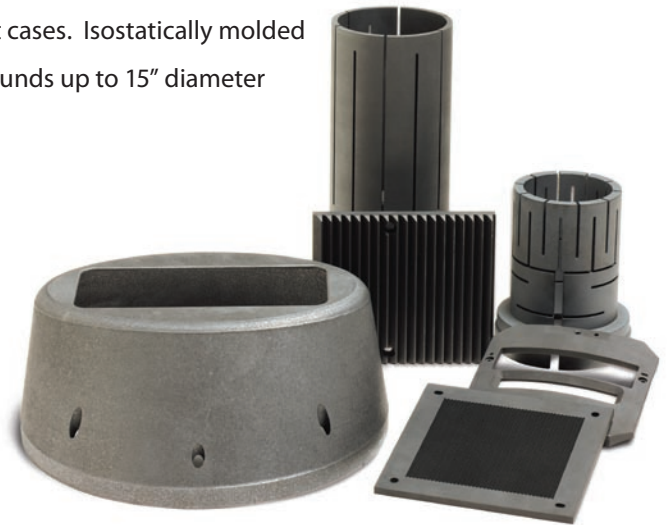
MorganAM&T™

Graphite

Morgan AM&T manufactures a variety of extruded and isostatically molded graphite grades that can be machined or purified to our customers' specifications.

Extruded rods are available in diameters up to 3" and in lengths up to 120". Outside diameters can be ground to a tolerance of 0.001" in most cases. Isostatically molded billets are available in sizes up to 10" x 17" x 50" and in rounds up to 15" diameter and 24" length.

By working closely with each customer, Morgan AM&T determines the proper grade selection for each need. Our engineers carefully consider critical material properties such as density, electrical resistance, strength and thermal expansion. In addition to our own graphite grades, Morgan AM&T also has access to all major grades of commercially available graphite, ensuring that we will meet your specific needs.



Our Glassy Carbon Impregnation and Glassy Carbon Coating products make our finished graphites the leading products in the industry. These proprietary graphite enhancements provide excellent performance in applications where our customers need the following properties:

- high density
- high purity
- low permeability
- non-porous surfaces
- particulate free
- out-gas free





Morgan AM&T's modern machining facilities are equipped to machine all types of graphite shapes and sizes up to 24" x 72" cross section and 45" in diameter. Tolerances as close as +/- 0.0002" and surface finishes of 4 rms can be achieved on most applications.

For applications that demand low trace metallic content, Morgan AM&T offers two levels of graphite purification to meet our customers' needs. Our **standard purification process** offers typical purity levels of less than 5 ppm total metallics, through the use of a computer-controlled halogen process. Our industry-leading **Morgan Advanced Purification (MAP)** process yields total metallic content that is typically below GDMS detection limits.

Morgan AM&T IsoMolded Graphite Grade Typical Properties

	Units	M-303	M-305	M-403	M-555
Max Size Available: Rounds	inches ¹	15 x 24	16 x 24	–	–
Max Size Available: Billets	inches ²	10 x 17 x 50	10 x 17 x 50	6 x 12 x 24	4 x 10 x 17
Max Grain Size	microns	7	16	5	7
Apparent Density	g/cc	1.82	1.72	1.85	1.85
Flexural Strength	MPa	58	38	64	200
Compressive Strength	MPa	117	77	134	400
Electrical Resistivity	(x 10 ⁻⁴) Ω-cm	14	16	12	14
Thermal Conductivity	W/m/K	93	78	100	93
Coefficient of Thermal Expansion	(x 10 ⁻⁶) /° C	5.2	5.5	5.2	5.2
Scleroscope Hardness		65	55	80	76
Porosity	%	9	13	7	7
Ash Content	ppm	< 500	< 500	< 500	< 500

¹ diameter x length
² width x height x length

Morgan AM&T Extruded Graphite Grade Typical Properties

	Units	HSC	ECR	ECV		ES1002	CMG
Geometry		Pipe	Rod	Rod		Rod	Rod
Max Size Available	inches ¹	2.0 x 1.5	2.0	< 1.0	> 1.0	2.0	1.25
Mean Grain Size	microns	–	152	152	152	152	76
Density	g/cc	1.54	1.60	1.60	1.68	1.70	1.80
Electrical Resistivity	μΩ-meter	14	7.5	6.5	5.5	4.83	10
Flexural Strength	MPa	–	20.7	20.7	24.1	24.1	41.4
Tensile Strength	MPa	–	13.8	13.8	17.9	17.9	31
Compressive Strength	MPa	–	41.4	41.4	48.3	48.3	68.9
Thermal Conductivity	W/m/K	45	–	–	–	–	–
Ash Content	%	–	< 0.1	< 0.1	< 0.1	< 0.025	< 0.6

¹ Pipe: outside dimension x inside dimension; Rod: outside dimension



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