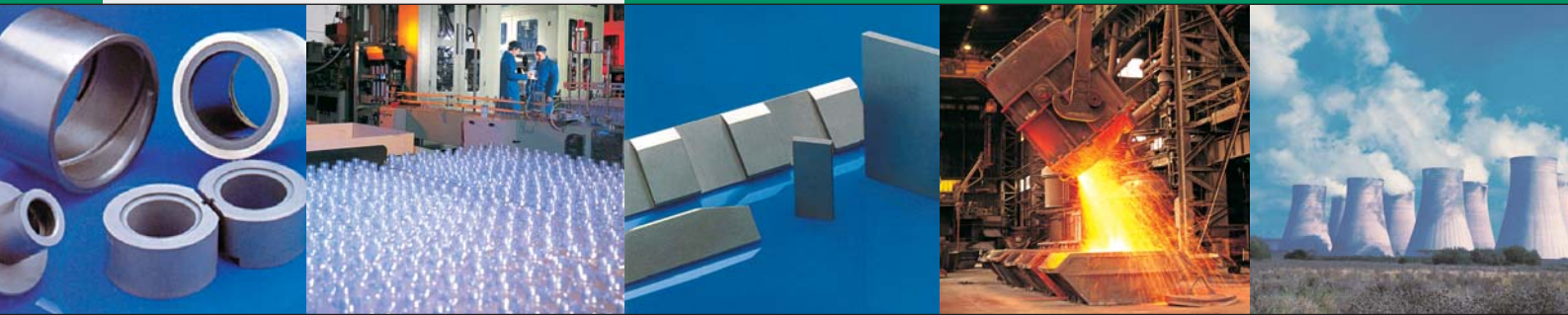




MORGAN
INDUSTRIAL CARBON

MORGAN INDUSTRIAL CARBON



PUMPS COMPRESSORS STEEL INDUSTRY PAPER MILLS FOOD INDUSTRIES OIL REFINERIES CHEMICAL INDUSTRIES GLASS & METALLURGICAL INDUSTRIES RAIL CHEMICAL INDUSTRIES POWER GENERATION INDUSTRY

mechanical carbon

physical properties

PHYSICAL PROPERTIES of carbon-graphite

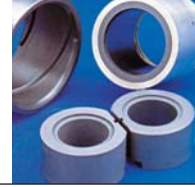
MSDS	Comp. Type	Grade	Hardness Sceleroscope	Density (g/cc)	Transverse Strength (psi)	Transverse Strength (Mpa)	Compressive Strength (psi)	Compressive Strength (Mpa)	Elastic Modulus (psi x 10 ⁶)	Elastic Modulus (Gpa)
BEARINGS										
A	CGR	P-658RCH	95	1.83	11,500	79	34,000	234	3.5	24
E	CGSb	P-7465H	95	2.25	14,000	96	40,000	276	3.8	26
A	CG	CTI-101	50	1.55	5,500	38	15,000	103	1.6	11
B	CG	CTI-202								
A	G	CTI118 *	85	1.76	7,500	52	20,000	138	2.1	14
A	G	CTI-1812	95	1.86	10,000	69	27,000	186	2.6	18
A	G	P-6038C *	80	1.88	8,800	61	21,000	145	2.1	14
B	CG	CTI-22	75	1.77	8,500	59	24,000	165	2.4	17
A	CGR ⁺	CTI-25 *	85	1.84	10,000	69	31,000	214	2.8	19
B	CG	CY10	67	1.60	6,500	45	20,000	138	2.6	18
A	G	EY308	48	1.75	7,140	49	14,280	98		
A	CG	P-5 *	85	1.75	9,000	62	30,000	207	2.4	17
C	CGR	P-8765	85	1.80	9,000	62	27,000	186	2.6	18
B	CG	P-9	65	1.78	7,500	52	21,000	145	2.1	14
D	CGNiCr	MAT600	85	2.35	16,500	114	50,000	345	4.0	28
C	CGCu	P-55	95	2.40	16,000	110	55,000	379	4.4	30
D	CGAg	P-5Ag	95	2.45	16,000	110	47,000	324	4.0	28
F	GF	P-3310	90	2.05	11,000	76	30,000	207	2.6	18
SEAL RINGS										
A	CG	CY10	67	1.60	6,500	45	20,000	138	2.6	18
J	CGBr	P-6289	80	2.45	13,500	93	37,000	255	4.4	30
F	G	P-3310	90	2.05	11,000	76	30,000	207	2.6	18
A	CGR	CNFJ-B *	83	1.80	8,500	59	29,000	200	3.3	23
A	CGR	MAT4000 *	85	1.83	9,000	62	30,000	207	3.0	21
A	GR	CTI-1812 *	95	1.86	10,000	69	27,000	186	2.6	18
A	GR	P-6038C2	80	1.88	8,800	61	21,000	145	2.1	14
F	GF	CTI-2146 *	80	1.88	8,000	55	26,000	179	2.0	14
F	CGF	P-65NR-2	90	1.85	12,000	83	40,000	276	3.5	24
F	GF	TSD-2098	75	1.78	8,000	55	28,000	193	3.2	22
A	CGR	CNFJ * **	84	1.82	9,300	64	30,000	207	3.3	23
A	CGR ⁺	CTI-6 * **	90	1.86	11,000	76	36,000	248	3.0	21
A	CGR	CY10C * **	83	1.80	9,300	64	30,000	207	3.3	23
E	CGSb	CTI-35	90	2.40	12,500	86	40,000	276	3.6	25
E	CGSb	MY10K	80	2.50	13,000	90	40,000	276	4.8	33
E	CGSb	P-10225	80	2.25	10,000	69	30,000	207	3.8	26
I	CGSb	P-7465	95	2.25	14,000	96	40,000	276	3.8	26
A	CG	CTI-76 *	85	1.81	9,500	65	33,000	227	2.9	20
A	CGR ⁺	P-5600 * **	80	1.83	8,000	55	22,000	152	2.7	19
A	CGR ⁺	CTI-9 * **	90	1.83	11,000	76	37,000	255	3.2	22
A	CGR	P-658RC *	95	1.83	11,500	79	34,000	234	3.5	24
E	CGSb	P-10356	95	2.25	14,000	96	40,000	276	3.8	26
A	G	EY308 *	48	1.75	7,140	49	14,280	98		
A	G	P-03 *	75	1.82	8,000	55	20,000	138	1.8	12
HIGH TEMPERATURE SEALING RINGS										
F	GH	CDJ-83	95	1.76	9,000	62	36,000	248	3.2	22
F	GH	CJPS	60	1.77	8,000	55	26,000	179	2.0	14
F	GH	CTI-2116	90	1.84	8,000	55	23,000	158	2.3	16
F	GH	CTI-2118	85	1.80	7,500	52	22,000	152	2.2	15
F	GH	P-4229	95	1.85	11,500	79	42,000	289	3.6	25
ROTARY VANE COMPRESSORS/METERS										
A	CGR ⁺	CTI-25 *	85	1.84	10,000	69	31,000	214	2.8	19
A	CG	CY10	67	1.60	6,500	45	20,000	138	2.6	18
A	CGR ⁺	P-8765 * **	85	1.80	9,000	62	27,000	186	2.6	18
F	GF	P-7454	90	2.00	7,000	48	20,000	138		
A	CGR ⁺	AG21P/T *	85	1.70	10,000	69	24,000	165		
GLASS HANDLING										
A	G	P-03	75	1.82	8,000	55	20,000	138	1.8	12
A	CG	P-9	65	1.78	7,500	52	21,000	145	2.1	14
A	G	EY308	48	1.75	7,140	49	14,280	98	1.6	11
A	G	P-03	75	1.82	8,000	55	20,000	138	1.8	12
K	GF	P-10321	90	2.20	12,500	86	33,000	227	2.7	19
CONTINUOUS CASTING										
A	G	EY308	48	1.75	7,140	49	14,280	98		
A	G	P-03	75	1.82	8,000	55	20,000	138	1.8	12

Note: * Grades are considered Generally Recognized as Safe (GRAS) by the Food and Drug Administration (FDA)
 ** Grades are registered with WRAS for use in food-contacting applications.
 + Grades can be molded to near-net-shape.

and carbon grades

Porosity (%)	Thermal Expansion (in/in/Fx10 ⁶)	Thermal Expansion (mm/mm/°Cx10 ⁶)	Thermal Conductivity (Btu/h/ft ² F)	Thermal Conductivity (W/m ² K)	Temperature Limit (°C)	Temperature Limit (°C)	Application
5	2.7	4.9	5	9	600	316	Bearings/Rotary Steam Joints
	3.5	6.3	8	14	700	371	Bearings/Rotary Steam Joints
20	2.2	4.0	6	11	550	288	Bearings: Air
							Bearings: Air
10	2.0	3.6	32	57	900	482	Corrosive Service
0.5	2.4	4.3	35	62	850	454	Corrosive Service
4	2.0	3.6	40	71	900	482	Corrosive Service
8	2.4	4.3	8	14	550	288	General Purpose
1	2.8	5.0	8	14	500	260	General Purpose
15	2.0	3.6	12	21	482	250	General Purpose
13	1.9	3.5	105	187	750	399	General Purpose
18	2.5	4.5	5	9	600	316	General Purpose
	2.5	4.5	5	9	500	260	General Purpose
15	2.4	4.3	7	12	500	260	General Purpose
5	2.8	5.0	8	14	700	371	High Duty
5	2.7	4.9	8	14	600	316	High Duty
2	2.8	5.0	8	14	550	288	High Duty
0.5	2.3	4.1	45	80	1,000	538	High Temperature
15	2.0	3.6	12	21	482	250	Piston Rings
	2.4	4.3	8	14	500	260	Seal Rings
0.5	2.3	4.1	45	80	1,000	538	Piston Rings
2	2.9	5.2	8	14	600	316	Seal Rings, Bearings: Blanks
1	2.9	5.2	8	14	500	260	Seal Rings, Bearings: Blanks
0.5	2.4	4.3	35	62	850	454	Corrosive Service
4	2.0	3.6	40	71	900	482	Corrosive Service
5	1.7	3.1	15	27	1,200	649	Dry Running
2	3.1	5.6	4	7	500	260	Dry Running
7	2.8	5.0	8	14	750	399	Dry Running
1	2.9	5.2	8	14	600	316	General Purpose
0.1	3.1	5.6	8	14	500	260	General Purpose
2	2.2	4.0	12	21			General Purpose
0.2	3.1	5.6	10	18	650	343	General Purpose, Petroleum
2	2.6	4.7	13	23			General Purpose, Petroleum
	3.1	5.6	10	18	700	371	General Purpose, Petroleum
	3.5	6.3	8	14	700	371	General Purpose, Petroleum
1	2.5	4.5	8	14	700	371	General Purpose: Blister Resistant
5	2.6	4.7	8	14	500	260	General Purpose: Blister Resistant
0.5	2.8	5.0	8	14	700	371	High Duty
3	2.7	4.9	5	9	500	260	High Duty
	3.5	6.3	8	14	900	482	High Duty: Petroleum
13	1.9	3.5	105	187	750	399	Segmented
8	2.5	4.5	40	71	1,000	538	Segmented
5	1.2	2.2	5	9	850	454	Seal Rings/Bearings: Aircraft
5	1.7	3.1	15	27	1,200	649	Seal Rings/Bearings: Aircraft
8	2.1	3.8	32	57	1,000	538	Seal Rings/Bearings: Aircraft
8	2.1	3.8	32	57	1,000	538	Seal Rings/Bearings: Aircraft
6	2.9	5.2	9	16	900	482	Seal Rings/Bearings: Aircraft
1	2.8	5.0	8	14	500	260	Vanes/Rotors
15	2.0	3.6	12	21	482	250	Vanes/Rotors
	2.5	4.5	5	9	500	260	Vanes/Rotors
	4.0	7.2		0	900	482	Vanes: Dry running
	2.2	4.0			400	204	Vanes/Rotors
8	2.5	4.5	40	71	1,000	538	Fiberglass
15	2.4	4.3	7	12	500	260	Fiberglass
13	1.9	3.5	105	187	750	399	Gob Shoots/Vial Dies
8	2.5	4.5	40	71	1,000	538	Gob Shoots/Vial Dies
0.5	2.3	4.1	45	80	1,000	538	Take-Outs, Diablos
13	1.9	3.5	105	187	750	399	Casting Dies
8	2.5	4.5	40	71	1,000	538	Casting Dies

Key: CG - Carbon Graphite F - Film Former Ag - Silver Impregnation
 G - Graphite Sb - Antimony Impregnation NiCr - Nickel Chrome Impregnation
 R - Resin Impregnation Cu - Copper Impregnation H - High Temperature Impregnation



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