

Typical Properties of Industrial Graphite Grades

| | ZXF-5Q | ACF-10Q | AXF-3Q | AXF-5Q | AXM-5Q | AXZ-5Q | TM |
|-----------------------------------|---|---|---|---|---|---|--|
| Particle size | 1 µm (40 µin) | 5 µm (200 µin) | 5 µm (200 µin) | 5 µm (200 µin) | 5 µm (200 µin) | 5 µm (200 µin) | 1 µm (40 µin) |
| Pore size | 0.3 µm (12 µin) | 0.8 µm (32 µin) | 0.8 µm (32 µin) | 0.8 µm (32 µin) | 0.8 µm (32 µin) | 0.7 µm (28 µin) | 1.5 µm (60 µin) |
| Total porosity | 20% volume | 21% volume | 21% volume | 20% volume | 23% volume | 26% volume | 20% volume |
| Open porosity | 80% of total | 75% of total | 77% of total | 80% of total | 85% of total | 90% of total | 85% of total |
| Apparent density | 1.78 g/cm ³ (0.0641 lb/in ³) | 1.77 g/cm ³ (0.0637 lb/in ³) | 1.76 g/cm ³ (0.0636 lb/in ³) | 1.78 g/cm ³ (0.0641 lb/in ³) | 1.73 g/cm ³ (0.0623 lb/in ³) | 1.66 g/cm ³ (0.0598 lb/in ³) | 1.82 g/cm ³ (0.065 lb/in ³) |
| Compressive strength | 175 MPa (25,500 psi) | 186 MPa (27,000 psi) | 156 MPa (22,600 psi) | 138 MPa (20,000 psi) | 124 MPa (18,000 psi) | 103 MPa (15,000 psi) | 110 MPa (16,000 psi) |
| Flexural strength ¹ | 112 MPa (16,200 psi) | 97 MPa (14,000 psi) | 90 MPa (13,000 psi) | 86 MPa (12,500 psi) | 69 MPa (10,000 psi) | 52 MPa (7,500 psi) | 59 MPa (8,500 psi) |
| Tensile strength ² | 79 MPa (11,500 psi) | 69 MPa (10,000 psi) | 63 MPa (9,100 psi) | 62 MPa (9,000 psi) | 48 MPa (7,000 psi) | 34 MPa (5,000 psi) | 41 MPa (6,000 psi) |
| Modulus of elasticity | 14,500 N/mm ² (2.1 10 ⁶ psi) | 11,000 N/mm ² (1.6 10 ⁶ psi) | 11,000 N/mm ² (1.6 10 ⁶ psi) | 11,000 N/mm ² (1.6 10 ⁶ psi) | 10,500 N/mm ² (1.5 10 ⁶ psi) | 9,000 N/mm ² (1.3 10 ⁶ psi) | 10,500 N/mm ² (1.5 10 ⁶ psi) |
| Tensile strain | 0.78 to failure % | 0.62 to failure % | 0.82 to failure % | 0.95 to failure % | 0.99 to failure % | n/a | n/a |
| Hardness | 86 SSH | 95 SSH | 80 SSH | 74 SSH | 72 SSH | 69 SSH | 65 SSH |
| Electrical resistivity | 1,950 µΩ-cm (770 µΩ-in) | 2,460 µΩ-cm (970 µΩ-in) | 1,815 µΩ-cm (715 µΩ-in) | 1,470 µΩ-cm (580 µΩ-in) | 1,650 µΩ-cm (650 µΩ-in) | 2,030 µΩ-cm (800 µΩ-in) | 1,220 µΩ-cm (480 µΩ-in) |
| Coefficient of thermal expansion | 8.1 µm/m°C (4.5 µin/in°F) | 7.6 µm/m°C (4.2 µin/in°F) | 8.1 µm/m°C (4.5 µin/in°F) | 7.9 µm/m°C (4.4 µin/in°F) | 7.8 µm/m°C (4.3 µin/in°F) | 7.6 µm/m°C (4.2 µin/in°F) | 8.2 µm/m°C (4.5 µin/in°F) |
| Thermal conductivity ³ | 70 µm/m°C (40 Btu•ft/ hr•ft ² •°F) | 60 µm/m°C (35 Btu•ft/ hr•ft ² •°F) | 85 µm/m°C (50 Btu•ft/ hr•ft ² •°F) | 95 µm/m°C (55 Btu•ft/ hr•ft ² •°F) | 88 µm/m°C (50 Btu•ft/ hr•ft ² •°F) | 70 µm/m°C (40 Btu•ft/ hr•ft ² •°F) | 105 µm/m°C (60 Btu•ft/ hr•ft ² •°F) |
| Oxidation threshold ⁴ | 450°C 840°F | 470°C 880°F | 455°C 850°F | 450°C 840°F | 460°C 860°F | 440°C 820°F | 460°C 860°F |

¹Measured using 4-point bend method.

²Estimated at 70% of flexural strength.

³Estimated value.

⁴Temperature that results in 1% weight loss in 24 hours. Oxidation threshold increases by approximately 100°C if graphite is purified.



300 Old Greenwood Road
Decatur, Texas 76234
USA

Customer Service
Tel +1 940 627 2121
Fax +1 940 393 8366

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