

PHYSICAL DATA OF THE PRINCIPAL GRADES

| Grade  | Material type         | Voltage drop | Coefficient of friction | Test conditions | Resis-tivity μΩm | Rockwell |        | Bending strength N/mm² | Bulk density g/cm³ | Metal content % |
|--------|-----------------------|--------------|-------------------------|-----------------|------------------|----------|--------|------------------------|--------------------|-----------------|
|        |                       |              |                         |                 |                  | HR10/40  | HR5/40 |                        |                    |                 |
| A15    | Copper-graphite       | l            | l                       | 7               | 4.0              | 100      | –      | 40                     | 2.65               | 40              |
| A16    | Copper-graphite       | vl           | m                       | 5               | 0.10             | 70       | –      | 40                     | 5.00               | 85              |
| A41    | Copper-graphite       | m            | m                       | 6               | 3.0              | 100      | –      | 20                     | 2.80               | 37              |
| A41X   | Copper-graphite       | m            | m                       | 6               | 4.0              | 105      | –      | 20                     | 2.90               | 37              |
| A90    | Copper-graphite       | vl           | l                       | 6               | 0.2              | 100      | –      | 30                     | 5.35               | 89              |
| B25    | Bronze-graphite       | vl           | l                       | 5               | 0.3              | 85       | –      | 85                     | 5.50               | 90              |
| B30    | Bronze-graphite       | vl           | l                       | 5               | 0.3              | 95       | –      | –                      | 5.60               | 90              |
| C16    | Metal-graphite        | l            | l                       | 6               | 1.0              | 100      | –      | –                      | 3.00               | 45              |
| C20    | Bronze-graphite       | vl           | l                       | 5               | 0.1              | 95       | –      | 80                     | 5.60               | 90              |
| C40    | Bronze-graphite       | vl           | l                       | 6               | 0.3              | 80       | –      | –                      | 4.05               | 75              |
| C40Z2  | Bronze-graphite       | vl           | l                       | 6               | 0.15             | 105      | –      | 55                     | 4.25               | 75              |
| C40Z3  | Bronze-graphite       | vl           | l                       | 6               | 0.2              | 100      | –      | 55                     | 4.20               | 75              |
| C50    | Bronze-graphite       | vl           | l                       | 6               | 0.5              | 95       | –      | 100                    | 5.65               | 92              |
| C60    | Bronze-graphite       | vl           | l                       | 5               | 0.6              | 100      | –      | 80                     | 5.70               | 92              |
| C70    | Bronze-graphite       | vl           | l                       | 6               | 0.3              | 105      | –      | 40                     | 3.70               | 67              |
| C72    | Bronze-graphite       | l            | l                       | 7               | 6.5              | 85       | –      | 25                     | 2.30               | 27              |
| C80X   | Bronze-graphite       | vl           | l                       | 6               | 0.70             | 100      | –      | 30                     | 3.10               | 50              |
| C80Y3  | Bronze-graphite       | vl           | l                       | 6               | 0.8              | 100      | –      | 25                     | 3.10               | 50              |
| C80Z2  | Bronze-graphite       | vl           | l                       | 6               | 0.8              | 100      | –      | 20                     | 3.15               | 50              |
| K14Z3  | Copper-graphite       | vl           | l                       | 6               | 1.0              | 110      | –      | 50                     | 3.30               | 62              |
| S11    | Silver-graphite       | vl           | m                       | –               | 0.05             | –        | 70     | 150                    | 7.50               | 95              |
| S13    | Silver-graphite       | vl           | l                       | –               | 8.0              | 75       | –      | –                      | 3.35               | 60              |
| S14    | Silver-graphite       | vl           | l                       | –               | 6.5              | 95       | –      | 25                     | 3.20               | 53              |
| S15    | Silver-graphite       | vl           | l                       | –               | 0.5              | 100      | –      | 30                     | 5.00               | 75              |
| S20    | Silver-graphite       | vl           | l                       | –               | 1.5              | 100      | –      | 25                     | 3.20               | 60              |
| S30    | Silver-graphite       | vl           | l                       | –               | 1.5              | 105      | –      | 30                     | 3.30               | 60              |
| S60    | Silver-graphite       | vl           | l                       | –               | 9.5              | 85       | –      | 25                     | 3.35               | 57              |
| SI10   | Silver-graphite       | vl           | m                       | 7               | 15               | 105      | –      | 20                     | 1.75               | 5               |
| SI20   | Silver-graphite       | vl           | m                       | 7               | 20               | 70       | –      | 20                     | 1.65               | 5               |
| SI30   | Silver-graphite       | vl           | m                       | 7               | 15               | 80       | –      | 12                     | 1.70               | 15              |
| SI40   | Silver-graphite       | vl           | m                       | 7               | 25               | 100      | –      | 20                     | 1.73               | 5               |
| F17    | Graphite              | l            | l                       | 6               | 25               | 90       | –      | 14                     | 2.20               | 20              |
| HG2643 | Graphite              | m            | l                       | 4               | 15               | –        | –      | 10                     | 1.30               | –               |
| HG6634 | Graphite              | m            | l                       | 4               | 18               | –        | –      | 10                     | 1.25               | –               |
| F40    | Resin-bonded graphite | h            | l                       | 3               | 115              | 100      | –      | 35                     | 1.80               | –               |
| F49    | Resin-bonded graphite | h            | l                       | 3               | 350              | 105      | –      | 30                     | 1.68               | –               |

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|       |                       |              |                         |                 |                  | HR10/40  | HR5/40 |                        |                    |                 |
| F51   | Resin-bonded graphite | h            | l                       | 3               | 300              | 100      | –      | 25                     | 1.70               | –               |
| F61   | Resin-bonded graphite | h            | l                       | 3               | 250              | 100      | –      | 30                     | 1.70               | –               |
| F63   | Resin-bonded graphite | h            | l                       | 3               | 250              | 75       | –      | 12                     | 1.60               | –               |
| E29   | Electrographite       | m            | l                       | 2               | 35               | –        | 90     | 25                     | 1.60               | –               |
| E43   | Electrographite       | m            | l                       | 7               | 20               | 100      | –      | 30                     | 1.70               | –               |
| E43Z3 | Electrographite       | m            | l                       | 7               | 20               | –        | 105    | 40                     | 1.80               | –               |
| E46   | Electrographite       | m            | m                       | 1               | 22               | 70       | –      | 10                     | 1.50               | –               |
| E46F3 | Electrographite       | m            | m                       | 4               | 22               | 70       | –      | 10                     | 1.50               | –               |
| E46X  | Electrographite       | m            | m                       | 1               | 22               | 90       | –      | 17                     | 1.60               | –               |
| E468  | Electrographite       | m            | m                       | 1               | 20               | 65       | –      | 10                     | 1.50               | –               |
| E49   | Electrographite       | h            | l                       | 1               | 55               | –        | 90     | 18                     | 1.60               | –               |
| E49X  | Electrographite       | h            | l                       | 1               | 55               | –        | 108    | 30                     | 1.70               | –               |
| E498  | Electrographite       | h            | l                       | 1               | 55               | –        | 90     | 16                     | 1.60               | –               |
| E50   | Electrographite       | h            | l                       | 1               | 100              | –        | 110    | 25                     | 1.64               | –               |
| E50X  | Electrographite       | h            | l                       | 2               | 100              | –        | 115    | 35                     | 1.70               | –               |
| E55   | Electrographite       | m            | l                       | 1               | 20               | –        | 85     | 25                     | 1.70               | –               |
| E558  | Electrographite       | m            | l                       | 1               | 20               | –        | 90     | 28                     | 1.75               | –               |
| E64Z4 | Electrographite       | m            | m                       | 2               | 40               | –        | 90     | 28                     | 1.70               | –               |
| E79X  | Electrographite       | m            | m                       | 1               | 35               | 90       | –      | 16                     | 1.65               | –               |
| E79Z1 | Electrographite       | m            | m                       | 2               | 40               | 105      | –      | 23                     | 1.65               | –               |
| E84S  | Electrographite       | m            | l                       | 2               | 32               | –        | 110    | 35                     | 1.70               | –               |
| E841  | Electrographite       | m            | l                       | 2               | 32               | –        | 110    | 38                     | 1.72               | –               |
| E88   | Electrographite       | m            | l                       | 2               | 40               | –        | 105    | 30                     | 1.70               | –               |
| E88X  | Electrographite       | m            | l                       | 2               | 40               | –        | 115    | 38                     | 1.75               | –               |
| E888  | Electrographite       | m            | l                       | 2               | 38               | –        | 105    | 28                     | 1.70               | –               |
| E101  | Electrographite       | m            | l                       | 1               | 45               | –        | 95     | 30                     | 1.60               | –               |
| E101X | Electrographite       | m            | l                       | 1               | 45               | –        | 105    | 35                     | 1.65               | –               |
| E104  | Electrographite       | m            | m                       | 4               | 28               | –        | –      | 5                      | 1.40               | –               |
| E105  | Electrographite       | m            | l                       | 1               | 43               | –        | 80     | 18                     | 1.54               | –               |
| E106  | Electrographite       | m            | l                       | 1               | 43               | –        | 95     | 25                     | 1.60               | –               |
| E108  | Electrographite       | m            | l                       | 1               | 45               | –        | 90     | 27                     | 1.60               | –               |
| E141  | Electrographite       | m            | l                       | 2               | 40               | –        | 115    | 35                     | 1.78               | –               |
| E151  | Electrographite       | h            | l                       | 2               | 95               | –        | 115    | 35                     | 1.70               | –               |
| E160  | Electrographite       | l            | m                       | 2               | 18               | 110      | –      | 28                     | 1.68               | –               |
| E220  | Electrographite       | m            | l                       | 2               | 60               | 115      | –      | 22                     | 1.70               | –               |
| L300  | Carbon-graphite       | h            | m                       | 7               | 23               | 95       | –      | 24                     | 1.62               | –               |
| L310  | Carbon-graphite       | h            | m                       | 7               | 33               | 90       | –      | 20                     | 1.73               | –               |