

Materials for Third and Forth Rail Applications

Third and Fourth Rail Systems

Steel, cast-iron, copper or bronze shoes on third and fourth rail collection systems inflict mechanical damage to the rail because of their relatively high mass. Their high co-efficients of friction also create excessive wear both to the collector and the rail. Once wear takes place, electrically conductive - and some times magnetic - debris is created, so motor windings and other systems must be protected. Inevitably sparking between damaged rail and collector also occurs, causing further problems of interference to telecommunications and signalling systems.

The use of carbon-based collector materials virtually eliminates all these problems. Carbon's relatively low mass (one third that of copper) minimises mechanical hammer damage to the rail, and its self-lubricating properties ensure a patina of carbon is deposited on the rail reducing friction and wear and almost completely eliminating sparking. As an added bonus, the carbon patina provides a degree of natural de-icing capability.

Carbon is particularly valuable as a collector material on systems using aluminium rails with stainless steel caps, where the margin for damage is greatly reduced.



Material Grades for Third and Fourth Rail Systems

| Grade | Description/Application | Typical Running Current | Typical Static Current | Specific Resistance | Density | Transverse Bend Strength | Hardness |
|---------|--|-------------------------|------------------------|---------------------|----------------------|--------------------------|--------------|
| | | (A/cm ²) | (A/cm ²) | (μΩm) | (g/cm ³) | (MN/m ²) | Sceleroscope |
| CY3TA | Plain Carbon Lead Free | 10 | 5 | 38 | 1.7 | 30 | 85 |
| CY280 | Plain Carbon Graphite Lead Free | 10 | 5 | 38 | 1.6 | 35 | 75 |
| MY7A | Metalsed CY3TA for higher strength and lower resistance Lead Free | 12 | 7 | 10 | 2.4 | 75 | 90 |
| MY7A2 | Metalsed CY280 for higher strength and lower resistance Lead Free | 12 | 7 | 5 | 2.5 | 70 | 75 |
| MY258A2 | Modified version of MY7A2 with added impregnation strength & resistivity Lead Free | 12 | 7 | <2 | 2.7 | 75 | 85 |
| MY258P | Metalsed pressed grade with very low resistivity Lead Free | 12 | 7 | <1 | 3.2 | 85 | 80 |
| MY131 | Metalsed dense base carbon to give low weight version of metalsed grade Lead Free | 12 | 7 | 8 | 2.2 | 80 | 105 |
| MY256 | Metalsed material with improved life suitable for underground applications Lead Free | 12 | 7 | 6 | 2.5 | 70 | 90 |

Higher operating values are achievable under certain conditions. Please contact our engineers for further information, as typical running and static currents are for guidance only.