

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.