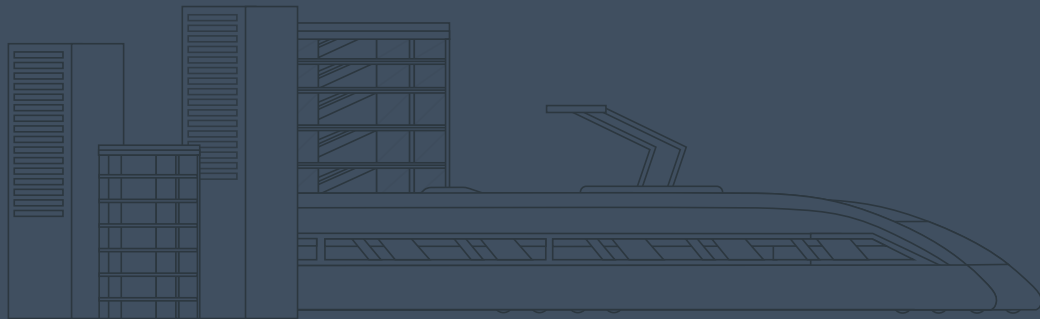




Performance Solutions for Railway



Performance Carbon



Transportation



Morgan Advanced Materials is a leading global supplier in the railway industry providing products, services and solutions for electrical motors and current collector systems.

We offer technical support and training to assist you in selecting the optimum solution with respect to performance and life of the motor and current collecting system for your transport vehicles.

Pantograph Strips

Morgan Offer a variety of collector strips to suit all your designs. Whatever your requirement Morgan Advanced Materials have the Pantograph strip for all applications that meet the requirements of the relevant international standards including:

TSI

EN50405/IEC64299

EN50367

EN50206

DIN6701

Morgan Advanced Materials supply mainline railway systems with self supporting carbon collector strips including epoxy bonding of carbon to aluminium providing:

- Reduction in pan head mass
- Improved dynamic response
- Reduction in maintenance and service costs

Morgan Advanced Materials has a unique method of achieving high mechanical strength whilst maintaining low resistance between carbon and metal carrier.

Morgan Advanced Materials have also developed a unique method of transferring high currents to give a low resistance current path in bonded collectors, resulting in an innovative light weight solution for DC applications.

Please contact us for a complete 3rd party reference list. Morgan Advanced Materials offer a variety of designs to suit your applications including arc protection alternatives.





Morgan Arc Protection Systems

When there is a break in contact between the overhead wire and the collector strip an electric arc can strike the strips metal support carrier causing severe damage and the need to replace the strip before the carbon is fully worn. To reduce the effect of this problem Morgan can provide solutions from sacrificial side plates to the proven Morgan Arc Protection Coating.

Morgan is an approved supplier to many systems worldwide including

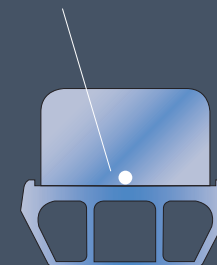
- Amtrak USA
- Austrian Rail
- Deutsche Bahn AG
- Guangzhou China
- MAV Hungary
- MTRC
- New Jersey Transit USA
- NEDTRAIN
- PKP
- Shanghai China
- SNCF
- Trenitalia
- UK Rail

Auto Drop Impact Detection System

Many high speed systems incorporate an impact detection system within the collector strip. This device enables the pantograph to be lowered if an impact was to occur severe enough to damage the pantograph head. The sensitivity of these systems varies according to the design, however the principle of all Auto-drop detection systems is the same.

The pantograph head is kept in place against the overhead wire by pneumatic pressure. When the carbon strip wears down to a particular level or is severely damaged, the air pressure is lost and the panhead drops away from the wire, preventing further damage. Morgan Advanced Materials have various designs which are running on many systems worldwide.

Responsive tube for high & low pressure systems



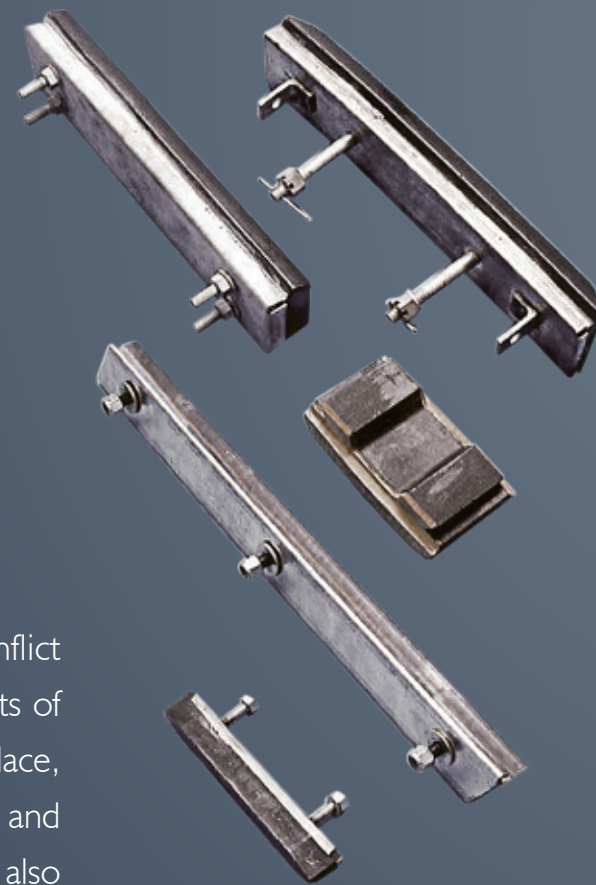
Materials for Third and Fourth Rail Applications

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.



Carbon Inserts for Trolley Bus Shoes

Morgan Advanced Materials have longstanding experience in the transport market providing a breadth of application knowledge built up over time ensuring the best materials and designs.

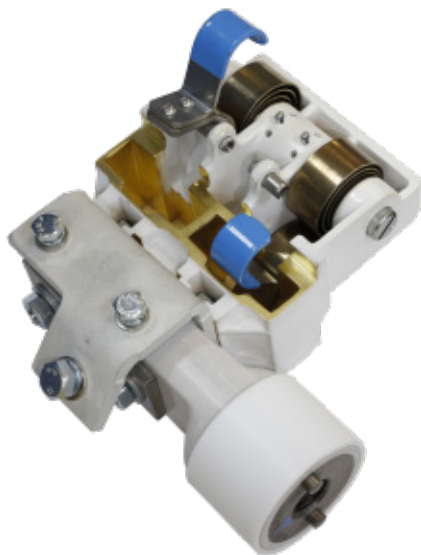
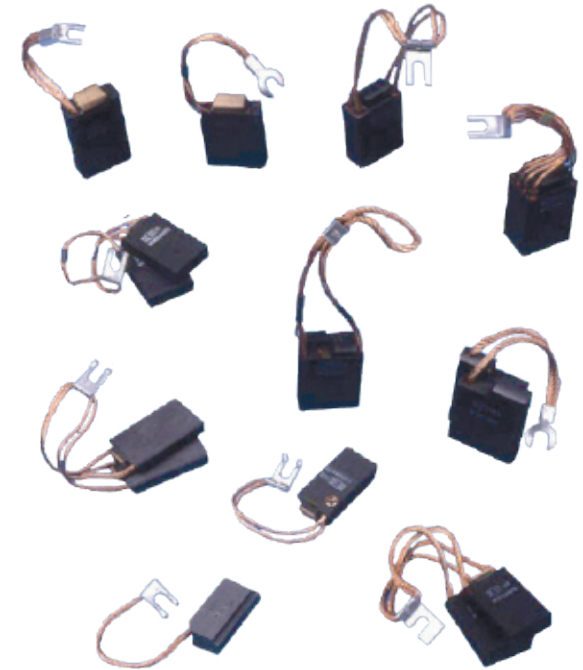
Leveraging on this experience we supply trolley bus inserts that are durable and the best fit for this application, such as double tapered for a safe fit.



Carbon Brushes and Carbon Contacts

Morgan Advanced Materials is a high performance brush manufacturer with over 100 years experience in serving the traction industry, offering National and Morganite products. Experience has ensured that we can advise the correct grade when considering DC traction systems that witness increased levels of vibration and thermal shock as a result of rapidly changing load currents and increased harsh conditions experienced through thyristor control and regenerative braking.

Morgan Advanced Materials, a global leader in the traction brush market, supplier to key OEM's and major railway companies, provides optimisation of brush/commutator performance.



Brush Holder Assemblies

Morgan Advanced Materials design and manufacture brushgear for a wide range of traction applications including mainline, suburban, metro and tramways. The arduous operating conditions are recognised in our design and production criteria.

Traction Brush Gear Upgrades

Morgan Advanced Materials has for many years designed and manufactured replacement brush gear.

We have the ability to redesign brush gear to replace obsolete or poor performing systems.

Typically our products will offer many of the features below

- Increased brush length
- Ease of maintenance and reduced down time
- Weight Reduction
- spring mechanism optimisation ie clock spring, constant force, pressure finger
- Improved commutation
- Improved brush support and brush life
- Complete and redesign , to offer the best solution catered specifically for the customer

Case Studies

Problem

- Obsolete brush gear
- No spares
- Fabricated brush box
- Oversize brush pockets



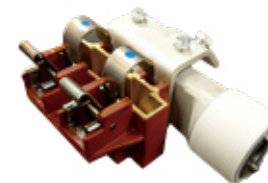
Solution

- Direct Acting clock springs
- Die cast brush box body
- Broached brush pockets
- Improved terminations
- Spring hold off position
- DMC Insulators



Problem

- Commutation issues
- Comm bar burning
- high volume of catastrophic flashovers
- Excessive brush wear



Solution

90% reduction in flash overs

- Converted constant force to clock spring mechanism
- Reduced spring failures
- Individual brush pockets
- Improved brush support
- Plug and Play system



Earth Return Current Units

Morgan advanced materials offer a variety of earthing units for a variety of applications for Metro, Tram and main rail. Morgan also have the ability to redesign or reverse engineer obsolete or poor performing brush gear.



Wheel Flange Lubrication

Morgan Advanced Materials have developed a range of solid lubrication products for Wheel Flange Lubrication. Through our materials expertise a number of materials have been developed to meet varying requirements of different rolling stock types, and performance improvements have been witnessed in terms of lubrication properties, film retention and product life based on arduous conditions seen in modern day service operation.



Insulator Assemblies

Moulded in either high strength GRP with excellent electrical and mechanical properties or mica glass for special hightemperature requirements.

Auto Coupler Contacts

Morgan Advanced Materials manufactures a wide range of high quality contacts used for a variety of coupling systems across the globe.

Morgan are a major OEM supplier of electrical contacts.

We also have the capability to reverse engineer contacts or to re-design existing contacts to improve reliability and ease maintenance.



ABOUT MORGAN ADVANCED MATERIALS



Morgan Advanced Materials is a global engineering company offering world-leading competencies in materials science, specialist manufacturing and applications engineering. We focus our resources on the delivery of products that help our customers to solve technically challenging problems, enabling them to address global trends such as energy demand, advances in healthcare and environmental sustainability.

What differentiates us?

- Advanced material science and processing capabilities.
- Extensive applications engineering experience
- A strong history of innovation and reinvention.
- Consistent and reliable performance.
- A truly global footprint.
- We find and invest in the best people.

Contact email

swanseacustomerservices@morganplc.com

Facilities and Accreditations:

With the Machine Test Laboratory and The Analytical Laboratory, Morgan has in-house capability in accordance with EN50405, and associated requirements, to allow independent TSI Certification of our facilities and products.

We have the following accreditations with the following bodies.

