



PANDROL and HEAVY HAUL RAILWAYS

Technology and Experience

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WHAT MAKES RAIL FASTENINGS FOR HEAVY HAUL DIFFERENT?

Heavy axle loads

High traction forces

..and often ...

Inaccessible places

Extreme climates



PRINCIPLE HEAVY HAUL CUSTOMERS:

Dedicated iron ore railways:

- FMG (Australia)
- Mount Newman (Australia)
- Rio Tinto Pilbara (Australia)
- VALE – Carajas (Brazil)
- QNS & L (Canada)
- LKAB (Sweden / Norway)
- Transnet – OrEx (S Africa)
- VALE – Vitoria Minas (Brazil)
- MRS (Brazil)

Dedicated coal railways:

- UP / BN – Powder River (USA)
- ARTC – Hunter Valley (Australia)
- QR - Goonyella (Australia)
- Transnet – CoalLink (S Africa)

Other coal / potash / intermodal, etc:

- Canadian National (Canada)
- Canadian Pacific (Canada)
- BNSF (United States)
- Union Pacific (United States)
- CSX (United States)
- KCS (United States)
- Norfolk Southern (United States)
- North-South Railway (Saudi Arabia)





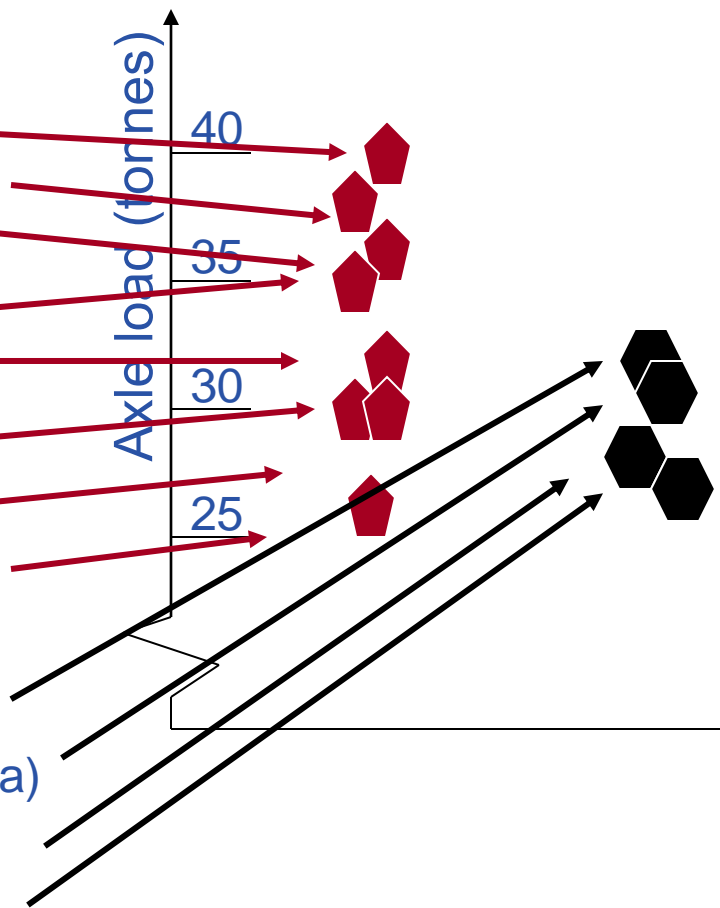
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PRINCIPLE HEAVY HAUL TRACK TECHNOLOGIES:

Most modern Heavy Haul tracks have monobloc concrete sleepers in ballast.





PRINCIPLE HEAVY HAUL TRACK TECHNOLOGIES:

Concrete sleepers are used with high toe load fastenings ...

typically 25 kN per rail seat

...and relatively hard plastic rail pads

usually made from thermoplastic polyurethane (TPU) or co-polyester

thermoplastic elastomer (TPE) and usually 5 – 8mm thick.





PRINCIPLE HEAVY HAUL TRACK TECHNOLOGIES:

Steel sleepers are used in some special applications.





PRINCIPLE HEAVY HAUL TRACK TECHNOLOGIES:

Steel sleepers are used with high toe load fastenings ...

typically 25 kN per rail seat

...and very hard plastic rail pads

usually made from high density polyethylene (HDPE) or thermoplastic polyurethane (TPU) and usually 5 – 6 mm thick.



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nos trilhos e o Brasil
vai bem de Trem



PRINCIPLE HEAVY HAUL TRACK TECHNOLOGIES:

Concrete slab track is used
in a few applications e.g. in
newer tunnels.





PRINCIPLE HEAVY HAUL TRACK TECHNOLOGIES:

Slab track is used with high toe load fastenings ...
typically 25 kN per rail seat
...and special resilient rail pads
usually made from natural (NR) or synthetic (SBR) rubber about 10mm thick.



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THANK YOU!