

## LOCOMOTIVE SECONDARY SUSPENSION ELEMENTS

### RAIL

#### PRODUCTS & SERVICES

- Primary suspension elements. Locomotives and passenger rolling stock.
- Secondary suspension elements. Locomotives and passenger rolling stock.
- Coil spring resilient pads.
- Traction pads.
- Engine and transmission raft suspensions.
- HVAC system resilient mounts and Seals
- Sterable bogie elements.
- Shock absorber support bushes.
- Drawbar, resilient slack adjuster wedges.
- General products

#### CAPABILITIES

- FEA design and validation.
- Unigraphics CAD design.
- Analysis for Modal vibration studies.
- NATA certified laboratory.
- Full formulation development and testing.
- Broad range of rubber processes.

#### QUALITY ASSURANCE

ISO 9001  
ISO 1401  
ISO/TS 16949



CERTIFIED QUALITY  
MANAGEMENT SYSTEM  
ISO 9001



CERTIFIED  
ENVIRONMENTAL  
MANAGEMENT SYSTEM  
ISO 14001



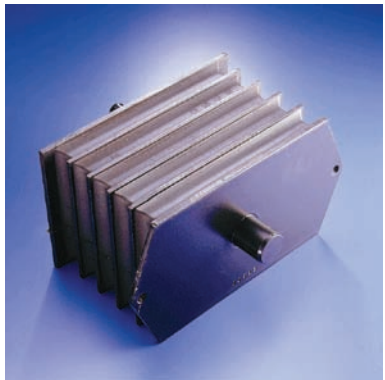
ISO TS 16949



Outer Secondary Suspension Pad  
2 per bogie over 2 bogies.

Carrying 30 tonne and subject to lateral deflections of up to 120mm, these secondary suspension pads are subject to significant loading.

Mackay's design team developed a secondary suspension system which provided as close to optimum bogie performance as the bogie design permitted.



Finite element modeling of the bogie assembly, considering traction pad, outer secondary pads and inner secondary pads at turn radii as small as 80 meters allowed Mackay to design secondary pads which gave the best possible properties to minimize wheel wear.

Inner Secondary Suspension Pad  
1 per bogie over 2 bogies.

Mackay has recently also won a supply contract for secondary suspension mounts and traction pads for 73 GE locomotives for Tibet. These locomotives will be manufactured under license by United Goninan in Australia.



#### Pacific National NR-Class

Axles: Co-Co  
Gauge: Standard  
Weight: 120 tonne  
Constructor: Goninan  
Power: GE Diesel Electric  
Initial Fleet: 120 locomotives  
Introduced: 1995



Worldwide  
Engineered  
Rubber  
Products

260 Chesterville Rd , Moorabbin , Victoria, 3189, Australia  
Phone: + 61 3 9555 6500 Fax: + 61 3 9276 8882  
www.mackayrubber.com.au Email : rail@mackayrubber.com.au