

PANDROL®

SAFELOK®



SAFELOK® Fasteners...

...extending rail life and reducing operating costs on concrete ties

Safelok® fasteners provide a positive and lasting rail alignment on concrete ties under the most severe operating conditions. The result is reduced track maintenance and extended track life.

The Safelok system consists of a clip, shoulder, pad and insulator. The wide, double leg design of the cast-in shoulder reduces stresses within the concrete tie, while at the same time providing high pullout resistance. Gage-holding qualities are excellent under the harshest conditions.

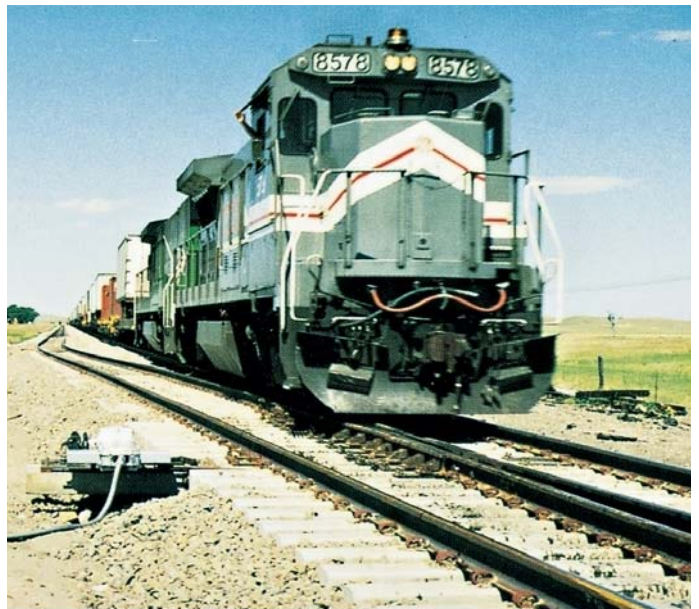


The performance-engineered design of Safelok fasteners starts with the alloy spring steel that maintains its high load-bearing capacity even after years of operation. Installation of Safelok fasteners is quick and easy with either hand tools or automated equipment.

The safety and security built in to Safelok fasteners is outstanding. Even in the unlikely event of a broken leg, the clip still retains 1,120 lbs (5kN) hold down force. It cannot work loose from the shoulder. Visual inspection is easy.

High Hold Down Force

Safelok fasteners continue to hold rails in alignment even after repeated removal and replacement. Nominally rated at 4,720 lb (21kN), its normal service range is 4,500 lb-5,600 lb (20kN-25kN). This ability to maintain hold down force means longer, safer service life.



Versatility

Safelok fasteners give optimum performance over a wide range of working conditions. This includes provisions for variations in manufacturing and installation tolerances of other rail components.

- Minimum safe deflection: 8mm.
- Maximum safe deflection: 17mm.

Installation and Removal

Automated clip installation machinery has been designed for use with track laying machines to provide a fast, cost effective method of clip insertion. Maintenance removal and refitting is easily done with hand tools.



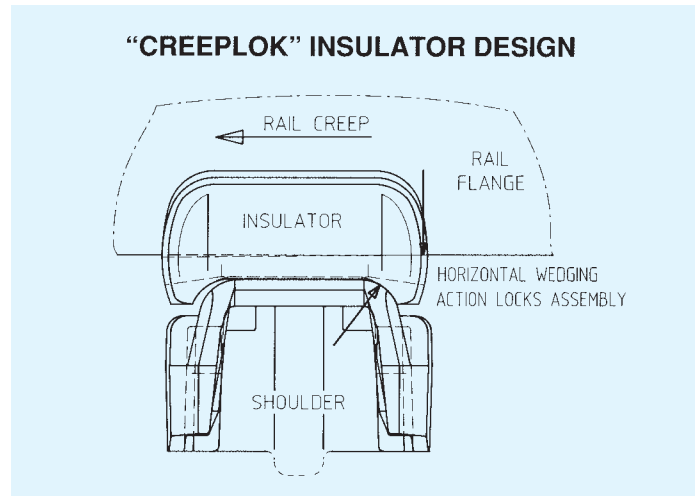
Special Features

- Positive locking design prevents properly installed clips from working loose.
- Able to withstand 1.4mm vertical oscillation over extended periods, greatly reducing risk of failure.
- Tapered “leg” design of the toe flexes and adjusts to variations in the seating angle.
- Double toe design provides maximum bearing area on the insulator, while reducing stress concentrations, increasing the working life.
- Large smooth radii design also reduces stress concentrations.

High Creep Resistance/Longitudinal Restraint

The Safelok fastening system delivers outstanding rail creep resistance of 3,600 lbs (16kN) per rail seat.

Greater safety and less maintenance are ensured by track stability and reduced skewing.



Matched Performance Pads and Insulators

Insulators and pads come in a variety of materials and designs to meet all operating conditions. Working in conjunction with the high hold down force of the clip, they improve creep resistance and augment track performance.



Research and Testing

The Safelok fastener has undergone a continuous series of field and laboratory tests. Without exception, Safelok fasteners meet or exceed the standards and requirements established by the world's major railroads.

Normal toe load limits:

Maximum 5,600 lb (25kN) @ 17mm deflection
 Minimum 4,500 lb (20kN) @ 13mm deflection

Safe toe load limits per rail seat:

Maximum 6,000 lb (27kN) @ 17mm deflection
 Minimum 2,700 lb (12kN) @ 8mm deflection

Creep resistance per rail seat 3,600 lb (16kN)

Shoulder safe vertical load 13,500 lb (60kN)

Attenuation - rail pad design

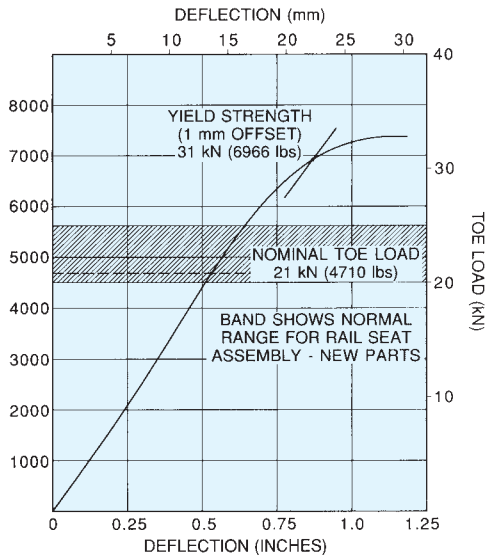
Pandrol can provide a low to high attenuation rail pad to suit your requirements.

These pads provide the following benefits:

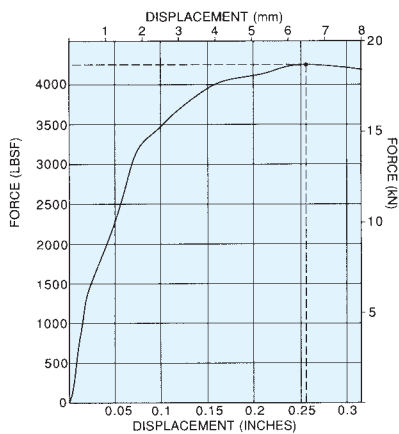
1. Lessen the effects of impact caused by wheel/rail interaction, wheel and rail defects and loose joints.
2. Reduce the risk of cracking ties.
3. Reduce track stiffness, improve ballast performance.
4. Reduce noise levels and vibrations.

Standard rail pad tested by a weight drop test on a strain gauged tie, showing the peak impact force approaching the tie

LOAD-DEFLECTION CHARACTERISTICS

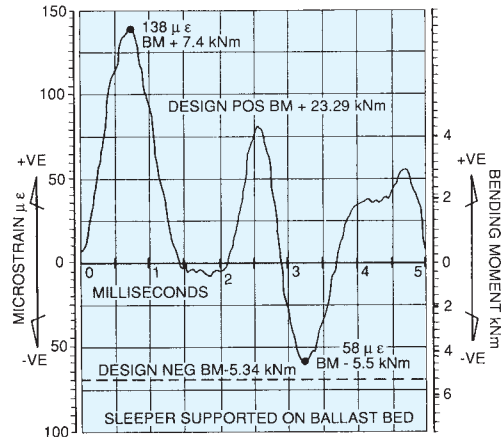


TYPICAL CREEP PERFORMANCE



Static Creep Resistance - Rubber Pads

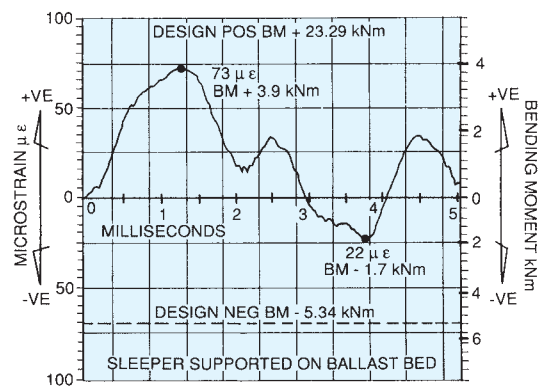
STANDARD RAIL PAD



design limits.

SAFELOK® is a registered trademark.
 In the interests of product improvement, Pandrol USA, LP

HIGH ATTENUATION RAIL PAD



High attenuation rail pad tested under the same conditions, showing that peak impact force is lessened to be within safe design limits.



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reserves the right to change the specifications contained herein at any time without prior notice.