



SIKA ICOSIT RAIL GROUT

System solutions for fixation of
LRT tracks



- Embedded & road crossings
- Elastic rail fixing- Discrete Fixation
- Light Mass Spring Systems
- Lawn Track

FIELDS OF APPLICATION

Icosit KC 330 series

- KC 330/10 Undersealing baseplates (discrete) and continuous for heavy loads (crane tracks etc.)
- KC 330 FK Flexible adhesive for fixing filler blocks

Icosit KC 340 series

- KC 340/35 Continuous undersealing and embedded (floating) rail designs for tram systems - Low Modulus
- KC 340/45 Continuous undersealing of grooved and T-rails (Light Rail) - Medium Modulus
-
- KC 340/65 Continuous undersealing of grooved and T-rails - High Modulus
- KC 340/4 Discrete fixation (undersealing baseplates) for light rail systems
- KC 340/7 Discrete fixation (undersealing baseplates) for railways (approved by German Railways DB AG)

Embedded Rail Design

- In-street installations
- Embedded (floating) rail installations
- Continuously undersealed rail

Main Advantages:

- Insulation against leakage of stray currents;
- Reliable track alignment (height adjustable);
- Levelling substrate tolerances;
- Low maintenance > Low life cycle costs;
- Reduction of vibration and mechanical wear (rail and rolling stock);
- Strong bond between rail and substrate limiting exposure of water/ice and salt on concrete reducing the cracking of the concrete;
- Emergency vehicle accessibility;
- Aesthetically pleasing finish.

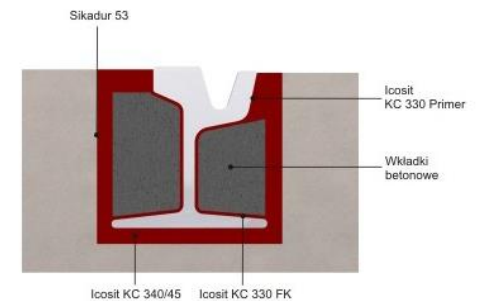
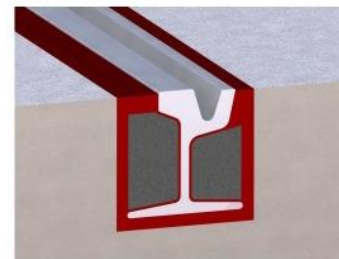
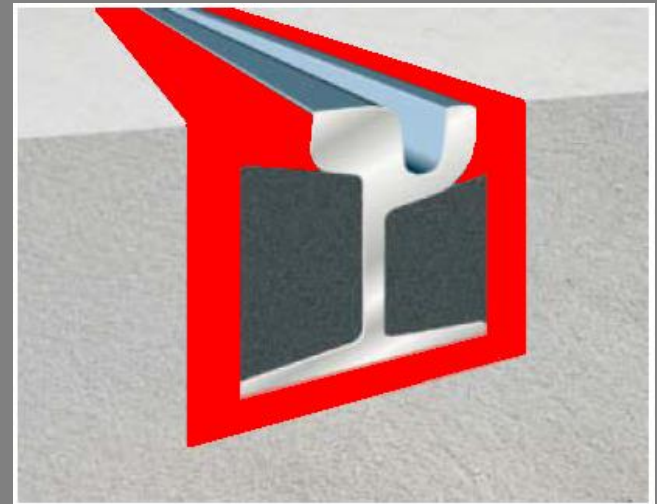
Icosit KC System ERS

Embedded Rail System



Icosit KC System ERS

Embedded Rail System



Icosit KC System ERS

Embedded Rail System



Icosit KC System ERS

Embedded Rail System



City of Elbląg, Maja Street

Icosit KC System ERS

Embedded Rail System



Warsaw, Rotary Dmowskiego

Icosit KC System ERS

Embedded Rail System



Tramdepot in
Zurich, Switzerland

Icosit KC System ERS

Embedded Rail System - Mainline

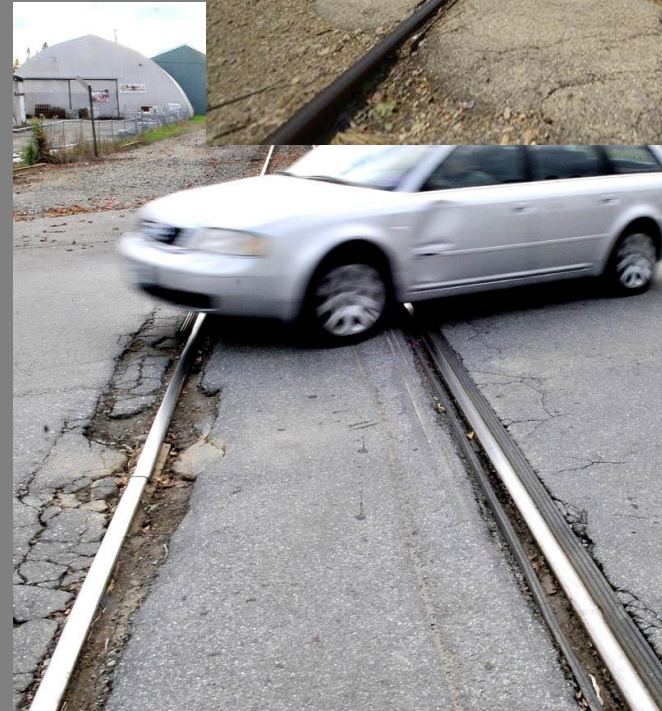


Bridge of Hungarian
Railways with ERS in steel
trough (Budapest circular
line)



Icosit KC System ERS

Road Crossings- Embedded vs. rubber boot

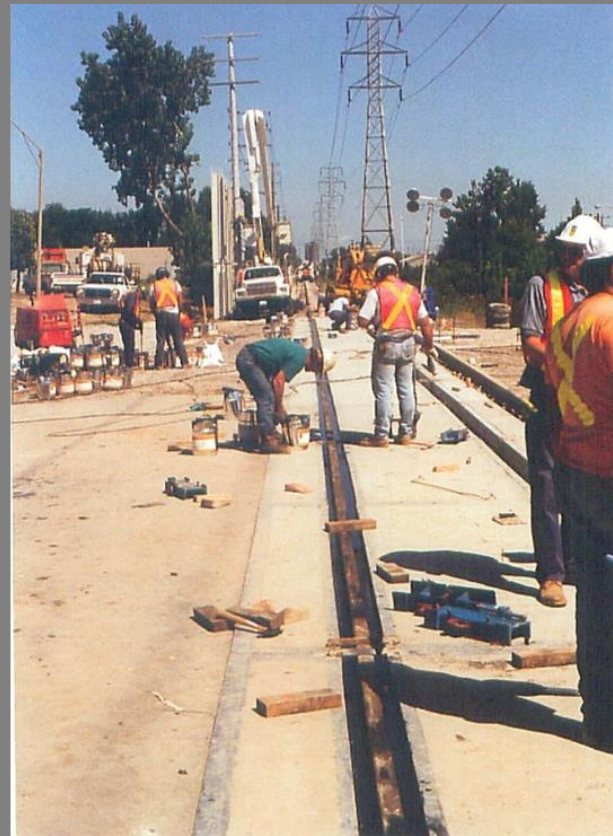


Windsor, ON road crossing
after 22 years in service

The Huron Church crossing in Windsor Ontario is the busiest grade crossing in North America. The volume of cross-border traffic that passes over its nine lanes exceeds 15,000 vehicles per day of which 12,000 are heavy trucks!



The crossing was constructed in 1992 using rail embedded in Icosit.

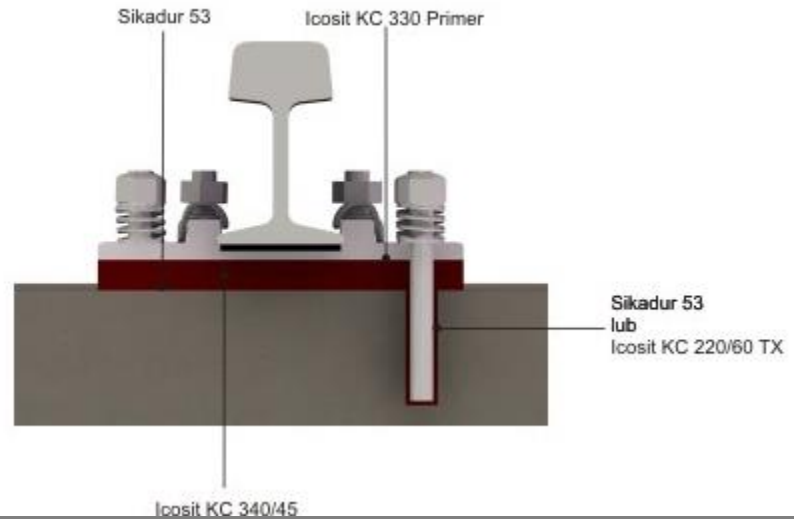
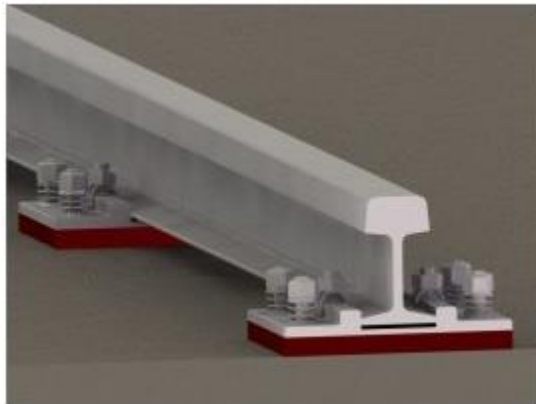


Icosit after 22 years.



Elastic Rail Fixing

Discrete Fixation



Discrete Fixation

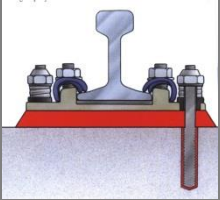
- Street independent installations
- Discrete, ballastless Fixation

Main Advantages:

- Insulation against leakage of stray currents;
- Reliable track alignment (height adjustable);
- Levelling substrate tolerances;
- Long durability, low maintenance > Low life cycle costs;
- Reduction of vibration and mechanical wear (rail and rolling stock);
- Less stress peaks on anchor bolts (shear forces) because of strong bond between slab track and baseplate
- Aesthetically pleasing finish, cleanliness
- Watertight undersealing > No erosion of concrete under the baseplate (hydraulic wear)

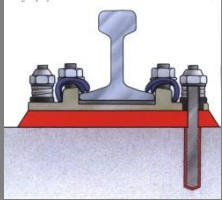
Icosit KC System

Discrete Fixation



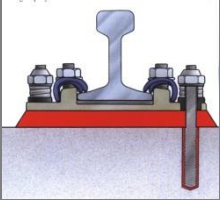
Icosit KC System

Discrete Fixation



Icosit KC System

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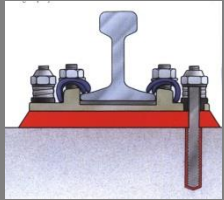


„Buehlertalbrücke“
(Stuttgart region)

- 25 years in service
- Mainline of DB AG
(German Railways)

Icosit KC System

Discrete Fixation

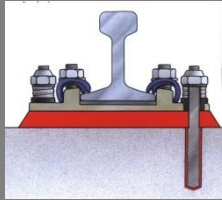


„Hochdonnbrücke“ (North of Germany)

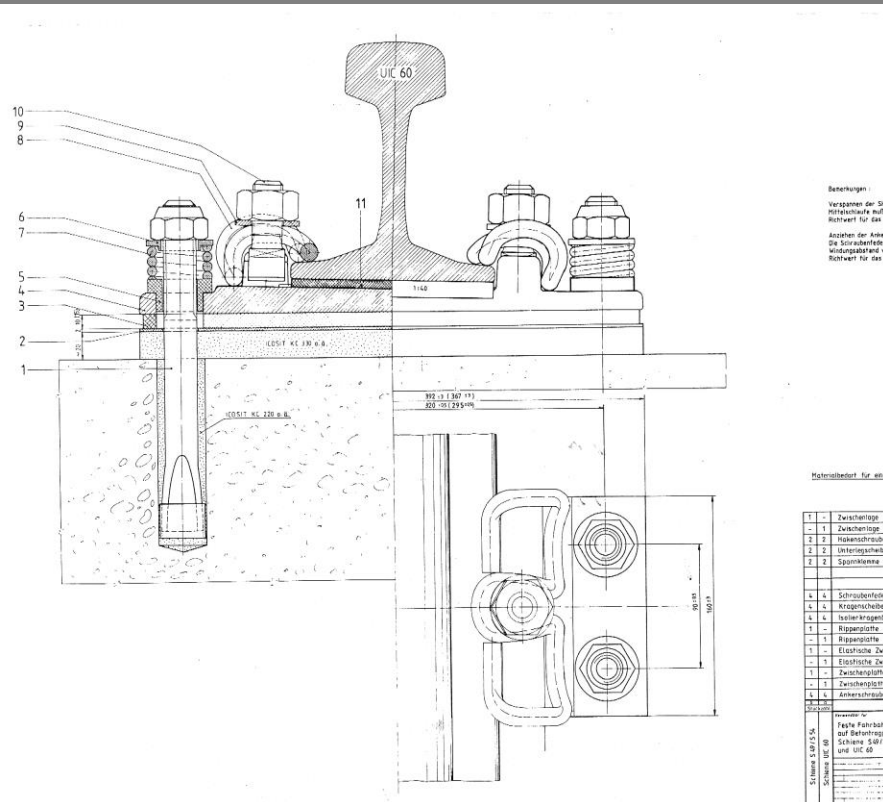
- Reconstruction during service!
 - Mainline of DB AG (German Railways)



Discrete Fixation



System loarg 336



kg 04.9000 April 2014.pdf - Adobe Reader

Datei Bearbeiten Anzeige Fenster Hilfe

1 / 1 66,7%

Werkzeuge Signieren Kommentieren

Produktbezeichnung	Hersteller	zulässige Schichtdicke	Verarbeitungs-temperatur	Verarbeitungs-zeit bei 20° C	Aushärtezeit bei 20° C bei 5° C	zulässiger Untergrund
V1/50 Pafel-Vergussmörtel	Pafel Spezial-Beton GmbH&Co. KG	20 – 120 mm	5 – 35 °C	> 120 min	> 24 h > 72 h	Betonfahrbahnplatten
V2/40 Pafel-Schnellvergussmörtel	Pafel Spezial-Beton GmbH&Co. KG	20 – 60 mm	5 – 35 °C	> 20 min	> 2 h > 2 h	Betonfahrbahnplatten
Silikal R 16 Vergussmörtel	Silikal GmbH & Co. KG	5 – 25 mm	-10 – 35 °C	> 12 min	> 2 h > 3 h	Betonfahrbahnplatten
Silikal R 17 Vergussmörtel	Silikal GmbH & Co. KG	5 – 25 mm	-10 – 35 °C	> 15 min	> 2 h > 3 h	Betonfahrbahnplatten
Isosil KC 220/60 TX	Sika Deutschland GmbH	15 – 100 mm	5 – 35 °C	60 min	> 18 h > 48 h	Betonfahrbahnplatten
Isosil KC 330/10	Sika Deutschland GmbH	15 – 60 mm	5 – 35 °C	8 min	> 3 h > 8 h	Beton-u.Stahlfahrbahnplatten
① Sikadur-12 Norge	Sika Deutschland GmbH	5 – 30 mm	-10 – 30 °C ④	10 min	> 2 h > 4 h	Betonfahrbahnplatten
② Isosil KC 340/7	Sika Deutschland GmbH	15 – 60 mm	5 – 35 °C	8 min	> 7 h > 24 h	Beton-u.Stahlfahrbahnplatten

Bemerkung:
Die Aushärtezeiten der Untergrundmaterialien sind abhängig von der Temperatur. Genaue Angaben sind den Datenblättern der Hersteller zu entnehmen.

(Verwendungsbereich) **EBA** Allgemeine Lösung

Hibensausgleich für Schienenfestigungssysteme Deutsche Bahn AG DB Systemtechnik Datum

log 04.9000

Überbautechnik-TIF 61

CAD-Zeichnung

Nicht von Hand ändern

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C: Problem gelöst? [] DB Systemtechnik Deutsche Bahn AG

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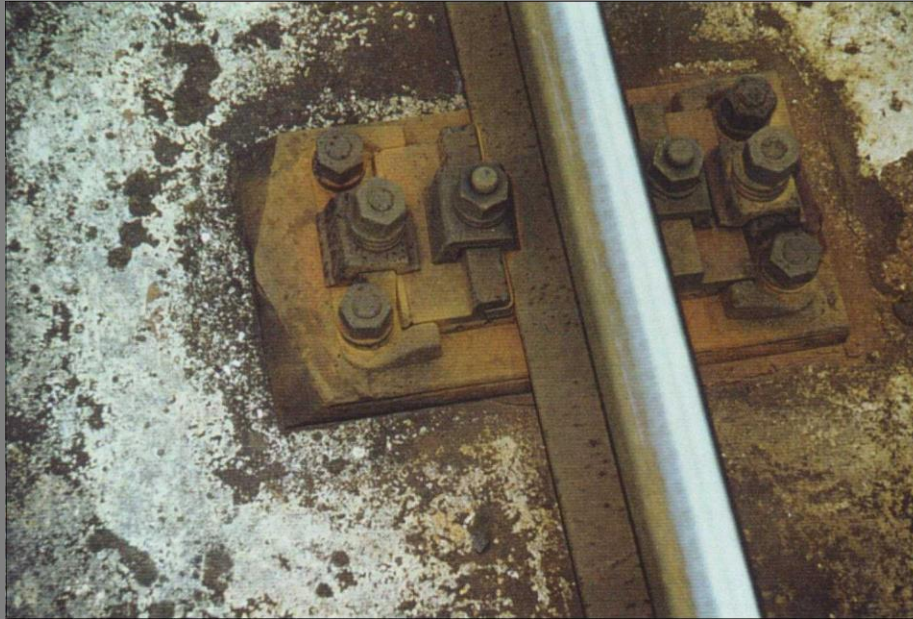
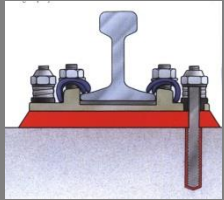
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Icosit products officially approved
by German Railways (DB AG)
>> on concrete slab and steel deck

Icosit KC System

Discrete Fixation



Proven durability:

1971 installed discrete fixation on a bridge of German Railways was removed in 1999 (still in good order) for testing at University of Munich.

Result: Only 6% loss of flexibility!

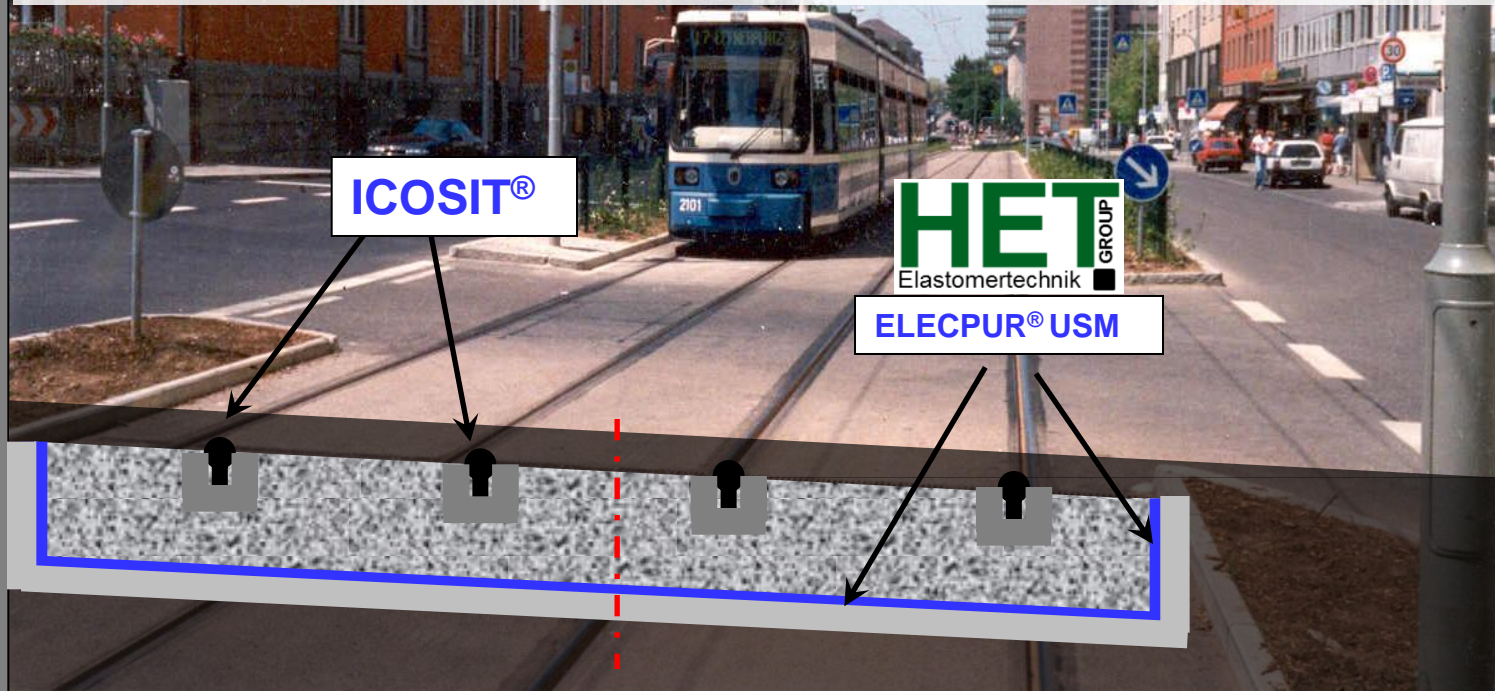
After 28 years still ok for many more years!



Tearing off by mechanical jacks

Light mass-spring systems

- A typical light mass-spring-system is a slab-track system with a concrete slab of 20 to 30 cm height on a full-surface layer.
- LMSS has established itself to a standardized solution for grooved rail systems in various cities.



Light mass-spring systems

- In-street installations
- Embedded (floating) rail installations
- Continuously undersealed rail

Main Advantages:

- **Dramatic reduction of vibration in key areas/intersections where noise/vibration are of major concern;**
- Insulation against leakage of stray currents;
- Reliable track alignment (height adjustable);
- Levelling substrate tolerances;
- Low maintenance > Low life cycle costs;
- Reduction of vibration and mechanical wear (rail and rolling stock);
- Strong bond between rail and substrate limiting exposure of water/ice and salt on concrete reducing the cracking of the concrete;
- Emergency vehicle accessibility;
- Aesthetically pleasing finish.

Light mass-spring systems



Light mass-spring systems

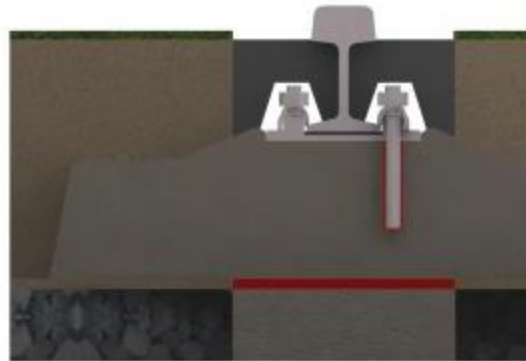
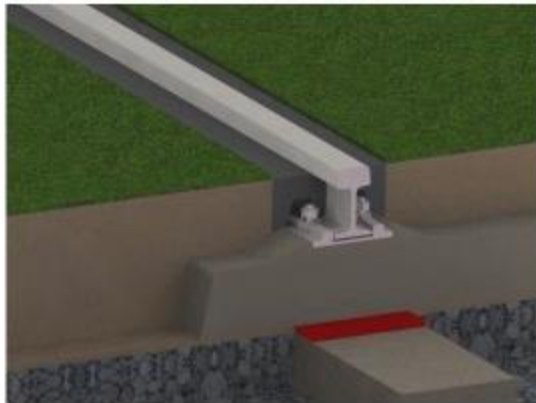


Light mass-spring systems



Elastic Rail Fixing

Lawn Track



Lawn Track

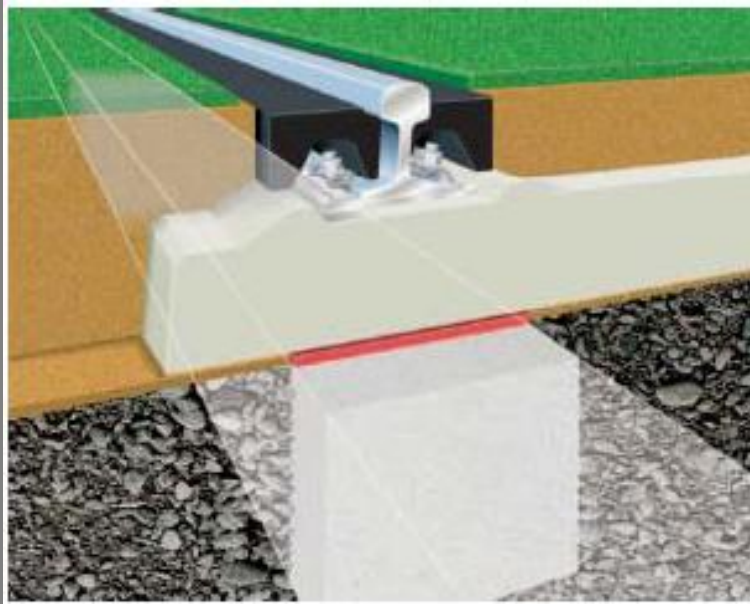
- Integrated installation
- Discrete Fixation

Main Advantages:

- Economical type of construction (use of standard elements from ballast track for rail fixation)
- Insulation against leakage of stray currents;
- Reliable track alignment (height adjustable);
- Levelling substrate tolerances;
- Low maintenance > Low life cycle costs;
- Reduction of vibration and mechanical wear (rail and rolling stock);
- Reduction of airborne and isolation of structure-borne sound
- Emergency vehicle accessibility;
- Aesthetically pleasing finish – „green village“ (Ecology/Sustainability)

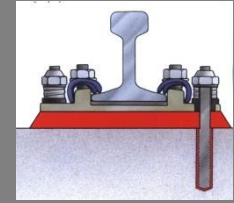
Icosit KC System

Green Track



Icosit KC System

Green Track



Icosit KC System

Green Track



SECTION B-B
Scale 1:25

CENTRE LINE TRACK No. 2

CENTRE LINE TRACK No. 1

ELYPEFORM FILLER BLOCK SYSTEM
GULDED TIGHT KC 75 R/F
FILL IN THE AGGREGATE COMPACTING

BRIEF PRIMER TRAM 1 = 2000mm
Geotextile
ICOBET KC 340/49 a=20mm/3mm

Geotextile

CONTINUOUS BEAM monolithic reinforced concrete

PROTECT COAT CONCRETE

NETTLE POINT F

DETAIL B

DRAINAGE # 100

DRAIN - a fall of 3%
PVC drainage blayers aggregate



NOTE : tolerance of $\pm 3\text{mm}$ BOTTOM BASE

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RAIL S-49

ELTEC PUR® FILLER BLOCK SYSTEM

Pawa SB-3

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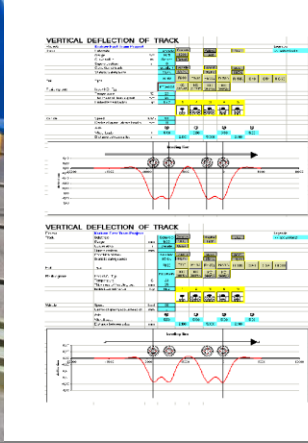
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RAIL COVERED KÖRST 255/277
+ GLUE KÖRST KÖ 75 FK
HUMUS
Geotextile
ANTICORROSION KÖRST 255/277
+ OPANKOWANIE
Polyurethane foam filling
PAD POLYPROPYLENE

550
800
550



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Full scale test facility



Servo hydraulic test facility



Thermal analysis

System solutions for elasticity in tramway tracks

Reasons for elasticity in superstructures

- Increased comfort & smooth train operation
- Reduction of noise and vibration
- Larger intervals for maintenance respectively maintenance free tracks
- Improved track stability
- Reduced maintenance costs
- Improved life cycle costs (LCC) of the track
- Reduced structural stress in slab tracks

