Smart Elastic Solutions for Reduction of Maintenance Costs
About us

Foundation
- 1969

Employees
- 240 in Bürs
- 100 outside Austria

Turnover
- 2015: EUR 78 million
- Ratio of exports: 85%

Owner
- Subsidiary of Getzner Mutter & Cie
Rail Corrugation
Rail Corrugation →
High Dynamic Forces
Degradation of Rail Pads
Degradation of Ballast
Elastic Elements in Railway Superstructures
Under Sleeper Pads

Sleeper pads
USP- under sleeper pads

Product overview

Geometry

Mounting mesh

Load distribution/protection layer

Spring layer PUR
Under Sleeper Pads
Under Sleeper Pads - Contact Area In Laboratory

With USP:

contact area: 27.8%

No USP:

contact area: 2.9%
Under Sleeper Pads - Contact Area in Track

Heavy Haul Coal Line
China | Fengsha
120 MGT annual tonnage
No cuts, holes, perforations
nor any other damage!

Avg. Contact Area
> 25%
Influence of Contact Area on Ballast Pressure

Reduction of pressure on ballast of min. 75%
Experiences – Long Pitch Corrugation (Geislinger Steige)
Measurement Results after Renewal (Rail profile)

Results (Rail profile)
- Installation May 2004
- Grinding Jun 2004
- R = 312 m

Filtering: Bandpass
Correction: Mean values
USP Reference

01. September 2004
30. November 2004

© TZF 6 U. Kleinert, M. Krüger, B. Ripke 17.10.2006
Improving Track Quality
ÖBB – Frankenmarkt / AT

Versuchsstrecke
V = 110 km/h

USP
c = 152 mm

c = 80 mm

R = 770.4
R = 420.7
R = 430.7
R = 420.7

R = 770.4
R = 420.7
R = 430.7
R = 420.7
Improving Track Quality
ÖBB – Frankenmarkt / AT

Frankenmarkt, Austria Track 1 - Standard Deviation Longitudinal Level
Radius $R = 280\text{m, } c=130\text{mm}$
loading 100 million tons,

no USP

Radius $R = 280\text{m, } c=130\text{mm}$, 
loading 100 million tons,

with USP

Source: Vortrag F. Auer / ÖBB; 2008 Bürs
Under Ballast mat

Sub-ballast mats
UBM- under ballast mats

Product overview

Geometry

- Multi layer construction (2 or 3 layers)
- Various stiffness and thickness possible
- For all static stiffness different dynamic values
- No geometry necessary to provide the elasticity
Visual Inspection after 50 Mio. Load Tons

Section with ballast mat in perfect condition

First signs of ballast deterioration (section without ballast mats)
Under Ballast Mat
Ballast Protection on Bridges
TTCl – Pueblo / USA

UBM after 750 MGT in good state
Getzner Ballast mats can be installed directly on packed subsoil or on concrete.
Getzner Ballast mats can easily be cutted.
Joints can be welded also in wet and cold conditions
UBM- under ballast mats

Installation

UBM accessible with rubber tyred vehicles.
Installation of a Sylomer UBM type B 851 in the year 1983 as refitting of the track in the area of the Cultural Centre „Gasteig“ in Munich

Approval of the performance of the UBM before installation (test specimen TU Munich) and after Installation (measurements in the tunnel, Müller BBM) 1983

Removal and measurements in the year 2000; Measured deviation compared to the values of 1983 are within the tolerances at time of delivery and installation

Relevant parameters at removal in 2013:
- UBM is completely submerged in water at the tunnel floor (see picture)
- Ballast height is not more than 18 cm under sleepers
- Load since installation: 1,4 billion load tons
Under Ballast Mat
Long Term Reference Gasteig
Munich / Germany
Project „Gasteig“, Munich

Results:

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2000</th>
<th>1983</th>
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<tbody>
<tr>
<td>$C_{\text{stat.}}$</td>
<td>0.0090 N/mm³</td>
<td>0.0087 N/mm³</td>
<td>0.0083 N/mm³</td>
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<tr>
<td>sample 200 mm x 200 mm, 3rd load cycle, calculated between 0.1 N/mm² und 0.2 N/mm²</td>
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<tr>
<td>$C_{\text{dyn.}}$</td>
<td>0.0392 N/mm³</td>
<td>0.0396 N/mm³</td>
<td>0.0388 N/mm³</td>
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<tr>
<td>preload 0.03 N/mm², 20 Hz</td>
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Summary:
The measured static bedding modulus after 29 years under operation still meets the requirement (0.008 N/mm³ (+/- 0.001N/mm³)) at time of delivery in the year 1983. The dynamic bedding modulus has, compared to 1983, only changed about 10 % (Recommendation of DIN 45673: max. 20%, after 12.5 million load cycles)
Before installation of UBM
Under Ballast Mat
Ballast Protection on Bridges
Union Pacific – Nebraska / USA

Before installation of UBM
Under Ballast Mat
Ballast Protection on Bridges
Union Pacific – Nebraska / USA

Installation of UBM
Visual inspection after 2 years or 500 MGT without maintenance
Under Ballast Mat
Ballast Protection on Bridges
Union Pacific – Nebraska / USA

750 MGT without maintenance
Thank you for your attention

Advantage of elastic elements on maintenance in ballasted track