



1. Application Sector

DAMTEC® SBM K 10V is an isolation and protection mat for railway track constructions, proofed in accordance to DIN 45673-5 - mechanical vibrations – resilient element used in railway tracks – part 5: laboratory test procedures for under ballast mats.

Typical applications are conventional main lines (≤ 225 kN / ≤ 200 km/h), high-speed lines (≤ 200 kN / ≤ 320 km/h) and freight lines with and without heavy axle loads (≤ 300 kN / ≤ 120 km/h). Urban rail or industrial tracks are use cases as well.

Higher axle loads up to 400 kN are suitable if speed is below 80 km/h. Other speeds have to be clarified if the material pressure on the UBM will be higher than 0.30 N/mm².

The sub ballast mat K mat absorbs vibrations and reduces acoustic emission as well as structure borne sound transmission. It is also effective in reducing the frequency of the ballast maintenance requirement through reduced vibration and better-balanced loading. It protects construction and waterproofing.

2. Approval

- Conforms to the ASA and TfNSW Standard for Ballast (T HR TR 00192 ST), Section 11.6.
Track stiffness and ballast mat.
- Approved according to the Deutsche Bahn standards
- Meets V-Line Type approval.

The user releasing as a controlled design of the under ballast mat **DAMTEC® SBM K 10V** for ballasted track was approved by DB Netz AG from superstructure technical point of view under the TM-titel 4-2015-10511 I.NPF 1 to Ril 804,820,824.

3. Material

Special mixture of PU foam and high-quality rubber granulates with a PU elastomer bonding agent.

4. Appearance

Colour: Multi coloured

Surface: Granular texture surface is laminated with geotextile, white

5. Dimensions/Tolerances

Width: 1,250 mm ± 1.5 %

Length: 6,000 mm ± 1.5 %

Thickness: 10 mm ± 1.0 mm

Area weight: 6 - 7 kg/m²

(slabs and other lengths are possible on request for special projects)

6. Aptitude Test

Test in accordance to E DIN 45673-5 (DBS 918071) at Technical University Munich, Technical University Dresden and at Müller BBM in Planegg.

7. Installation

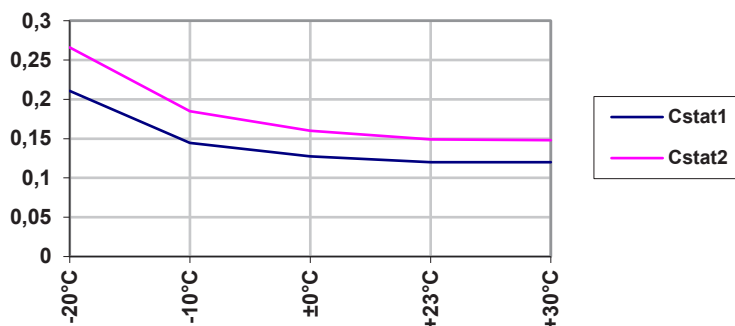
The installation has to be in accordance to installation instructions **DAMTEC® SBM K**. Note that with application and installation for DB AG (German Railway) guidelines for sub ballast mats, „Unterschottermatten einbauen“ (824.1510), have to be observed.

For structure borne noise insulation and isolation of secondary airborne noise an adhesion is not necessary.

8. Test Data

Tensile strength:	0.15 - 0.55 N/mm ²	(ISO 1798)
Elongation at break:	40 - 70 %	(ISO 1798)
Burning behaviour:	E	(EN 13501-1)
Thermal resistance:	- 30°C to + 80°C	
Chemical resistance:	Conditionally resistant to acids and bases	
Environmental resistance:	Oil-, aging-, rot-resistant and water-resistant	
Static bedding modulus (Cstat1)	0.12 N/mm ³	± 0.02 N/mm ³
Static bedding modulus (Cstat2):	0.15 N/mm ³	

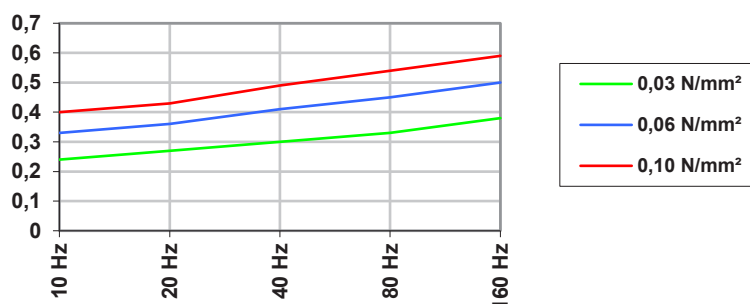
Influence of temperature on Cstat:



Dynamic bedding modulus (Cdyn1): ($\sigma_1 = 0.02 \text{ N/mm}^2$; $\sigma_2 = 0.10 \text{ N/mm}^2$)

0.173 N/mm ³ (bei 1 Hz)	+/-15%
0.197 N/mm ³ (bei 5 Hz)	+/-15%
0.210 N/mm ³ (bei 10 Hz)	+/-15%
0.224 N/mm ³ (bei 20 Hz)	+/-15%
0.235 N/mm ³ (bei 30 Hz)	+/-15%
(at -20°C)	Cdyn1(10Hz) = 0.617 N/mm ³
(at -10°C)	Cdyn1(10Hz) = 0.369 N/mm ³
(at ±0°C)	Cdyn1(10Hz) = 0.276 N/mm ³
(at +30°C)	Cdyn1(10Hz) = 0.201 N/mm ³

Dynamic bedding modulus (C_{dyn2}):



[no difference within the results for $LV = 100\text{dB}$ and $LV = 90\text{dB}$]

Horizontal static modulus (G_{stat}): 0.042 N/mm³
Horizontal deflection: $s = 0.13\text{mm} < 0.4\text{mm}$

Mechanical fatigue strength: Load phase 1 - $F_O/F_U = 75/10\text{kN}$ - 10 million load changes
Load phase 2 - $F_O/F_U = 100/10\text{kN}$ - 2.5 million load changes
(before load phase 1) $C_{stat1} = 0.099\text{N/mm}^3$ $C_{stat2} = 0.123\text{N/mm}^3$
(after load phase 1) $C_{stat1} = 0.093\text{N/mm}^3$ $C_{stat2} = 0.121\text{N/mm}^3$ - 6.1%
(after load phase 2) $C_{stat1} = 0.091\text{N/mm}^3$ $C_{stat2} = 0.119\text{N/mm}^3$ - 8.1%
[After 12.5 Mio. load changes **DAMTEC® SBM K** slightly impressions due to the contact with the ballast. Not any cracks and perforations could be detected with the naked eye.]

Water / frost resistance: -20 % for dynamic stiffness

Resistance for aging: Change of static stiffness +6% at 23°C
Change of static stiffness +7% at -20°C
change of weight -0.16%

Resistance to oil: After 7 days in mineral oil:
Tensile strength: average 0.31N/mm²
Elongation at break: average 43.16%

Frost / thaw resistance: (before test) $C_{dyn1}(5\text{Hz}) = 0.213\text{N/mm}^3$
 $C_{dyn1}(30\text{Hz}) = 0.252\text{N/mm}^3$
(after three changes) $C_{dyn1}(5\text{Hz}) = 0.165\text{N/mm}^3$
 $C_{dyn1}(30\text{Hz}) = 0.200\text{N/mm}^3$

Static stiffness for different load ranges:

max. load	secant modulus		C_{stat1}	secant modulus		C_{stat2}
[N/mm ²]	[N/mm ²]	[N/mm ²]	[N/mm ³]	[N/mm ²]	[N/mm ²]	[N/mm ³]
0.15	0.02	0.06	0.12	0.02	0.12	0.14
0.20	0.02	0.08	0.12	0.02	0.16	0.14
0.25	0.02	0.10	0.12	0.02	0.20	0.14
0.35	0.02	0.14	0.12	0.02	0.28	0.14

9. Accessories

• Adhesive tape: Gerband 613



SBM K 10V (under ballast mat) TM: 4-2015-10511 I.NPF 1



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Contact information:

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