



TECHNICAL DATA SHEET

SBM K 10 (UNDER BALLAST MAT) TM: 4-2015-10511 I.NPF 1

1. Application Sector

DAMTEC® SBM K 10 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.

Regarding the technical information of DB Netz AG the typical application for thickness 10mm is approved for main line railway with axle loads less than 25 tons and speeds higher than 200 km/h.

Higher axle loads are suitable and stiffness's have been tested for tracks with typical axle loads of 30 tons and speeds below 200 km/h. Due to quite linear deflection line static stiffness is the same for different loads.

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

The user releasing as a controlled design of the under ballast mat **DAMTEC® SBM K 10** forballasted 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



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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/m ²	

(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.

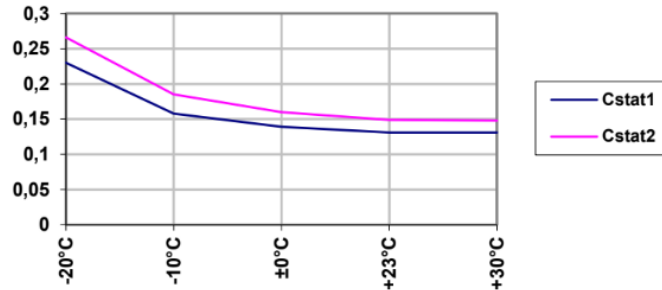
7. Installation

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 _{fl}	(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 (C _{stat1}):	= 0.12 N/mm ³	± 0.02 N/mm ³
static bedding modulus (C _{stat2}):	< 0.149 N/mm ³	

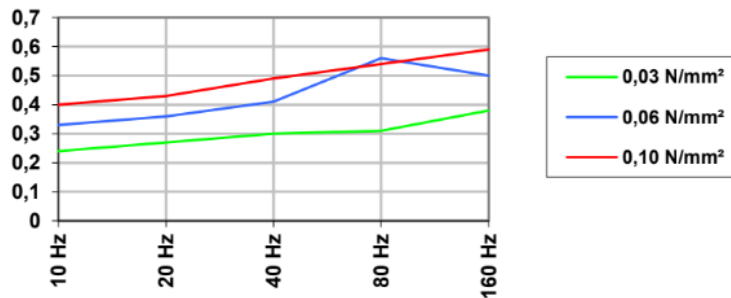
influence of temperature on C_{stat} :



dynamic bedding modulus (C_{dyn1}):

0.189 N/mm³ to 0.256 N/mm³
(depends on material thickness, load and frequency)
(at -20°C) $C_{dyn1}(10\text{Hz}) = 0.674 \text{ N/mm}^3$
(at -10°C) $C_{dyn1}(10\text{Hz}) = 0.403 \text{ N/mm}^3$
(at ±0°C) $C_{dyn1}(10\text{Hz}) = 0.301 \text{ N/mm}^3$
(at +30°C) $C_{dyn1}(10\text{Hz}) = 0.219 \text{ N/mm}^3$

dynamic bedding modulus (C_{dyn2}):



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

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

[After 12.5 Mio. load changes DAMTEC® sub ballast mat K slightly impressions due to the contact with the ballast.

Not any cracks and perforations could be detected with the naked eye.]



(before load phase 1)	$C_{stat1} = 0.099\text{N/mm}^3$	$C_{stat2} = 0.123\text{N/mm}^3$
(after load phase 1)	$C_{stat1} = 0.093\text{N/mm}^3$	$C_{stat2} = 0.121\text{N/mm}^3 - 6.1\%$
(before load phase 2)	$C_{stat1} = 0.093\text{N/mm}^3$	$C_{stat2} = 0.121\text{N/mm}^3$
(after load phase 2)	$C_{stat1} = 0.091\text{N/mm}^3$	$C_{stat2} = 0.119\text{N/mm}^3 - 8.1\%$

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 [N/mm ²]	secant modulus		C_{stat1} [N/mm ³]	secant modulus		C_{stat2} [N/mm ³]
	[N/mm ²]	[N/mm ²]		[N/mm ²]	[N/mm ²]	
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

- adhesives for horizontal areas: Körapur 672 / Köracur TH 650
- adhesives for vertical area: Körapur 666 / Köracur TH 650
- adhesive tape: Gerband 602.25 (laminated with geotextile)

DISCLAIMER:

The information provided is intended only as a summary and general overview on matters of interest. The information is not intended to be comprehensive nor does it constitute expert advice. PROJEX shall not be liable for incidental and/or consequential damages directly or indirectly sustained, nor any loss caused by not complying with relevant industry/product standards and improper use of any Damtec® products. Due to varying construction methods, any other circumstances not stated above should be brought to the attention of PROJEX for review. For suitability to the prevailing site conditions, it is advised that certified testing should be conducted. It is recommended to seek further advice on your application with our technical staff prior to use.