



TECHNICAL DATA SHEET SBM K 20 (UNDER BALLAST MAT) TM: 2011-1022 I.NVT 4

1. Application Sector

DAMTEC® SBM K 20 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. Material

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

3. Appearance

colour: multi coloured
surface: granular texture

4. Dimensions/Tolerances

width:	1,250 mm	±1.5 %
length:	4,000 mm	±1.5 %
thickness:	20 mm	±1.0 mm
area weight:	approx. 13.0 kg/m ²	

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



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5. 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.

6. Installation

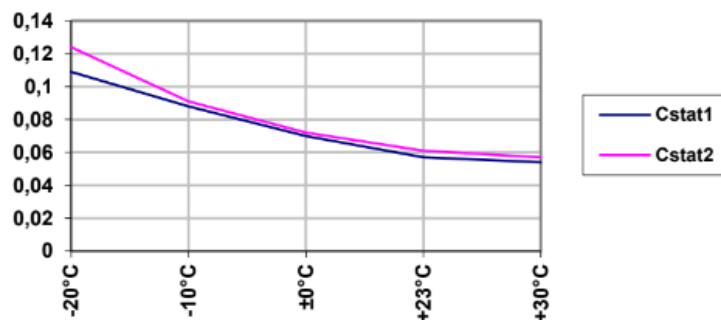
The installation has to be in accordance to installation instructions **DAMTEC® SBM K**.

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.

7. 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}):	= 0.06 N/mm ³	± 15%
static bedding modulus (C _{stat2}):	approx. 0.061 N/mm ³	
influence of temperature on C _{stat} :		

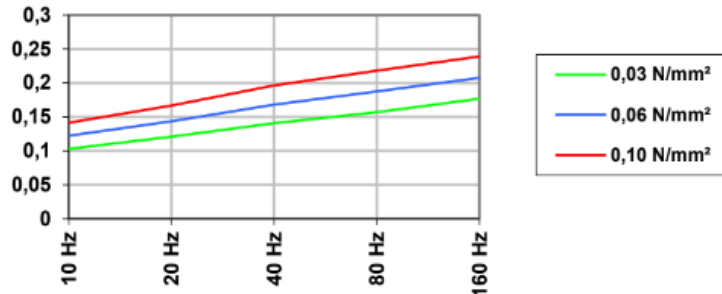




dynamic bedding modulus (C_{dyn1}):

0.073 N/mm³ to 0.107 N/mm³
 (depends on material thickness, load and frequency)
 (at -20°C) $C_{dyn1}(10\text{Hz}) = 0.386 \text{ N/mm}^3$
 (at -10°C) $C_{dyn1}(10\text{Hz}) = 0.232 \text{ N/mm}^3$
 (at ±0°C) $C_{dyn1}(10\text{Hz}) = 0.153 \text{ N/mm}^3$
 (at +30°C) $C_{dyn1}(10\text{Hz}) = 0.094 \text{ N/mm}^3$

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}):

0.021 N/mm³

Horizontal deflection:

$s = 0.26\text{mm} < 0.4\text{mm}$

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)	$C_{stat1} = 0.062\text{N/mm}^3$	$C_{stat2} = 0.065\text{N/mm}^3$
(after load phase 1)	$C_{stat1} = 0.063\text{N/mm}^3$	$C_{stat2} = 0.071\text{N/mm}^3 + 1.6\%$
(before load phase 2)	$C_{stat1} = 0.093\text{N/mm}^3$	$C_{stat2} = 0.121\text{N/mm}^3$
(after load phase 2)	$C_{stat1} = 0.063\text{N/mm}^3$	$C_{stat2} = 0.070\text{N/mm}^3 + 1.6\%$

[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.]

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%



Static stiffness for different load ranges:

Max. load	secant modulus		Cstat1	secant modulus		Cstat2
[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	0.060	0.02	0.12	0.062
0.20	0.02	0.08	0.059	0.02	0.16	0.061
0.25	0.02	0.10	0.057	0.02	0.20	0.062
0.35	0.02	0.14	0.056	0.02	0.28	0.066

8. Accessories

- adhesives for horizontal areas: Körapur 672 / Köracur TH 650
- adhesives for vertical area: Körapur 666 / Köracur TH 650
- adhesive tape: Gerband 602.25
- geotextile: Britex-PP/PET-250/1210-A100 GRK 4

9. Approval

The use of under ballast mat **DAMTEC® SBM K 20** for ballasted track was approved by DB Netz AG in an individual case-related technical note under the TM-titel 2011-1022 I.NVT 4 to Ril 82002010 and Ril 824.1510. The approval shall apply provisionally to operational testing. During testing, each application requires the consent of DB Netz, Zentrale, I.NVT 41.

DISCLAIMER:

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