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The anti-noise system for rail brakes on hump yard

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The anti-noise system for rail brakes on hump yard



In the past marshalling yards were located outside the cities and therefore the inhabitants were not exposed to the high frequency (squealing) noise, but an increase in the population growth has led to the fact that the local people are now living in their direct vicinity. These people are exposed to high levels of noise (over 130 dB) which have a very negative impact on their health.

State of the art:

Noise barriers



- + Minor noise reduction
- Passive protection
- Loss of sunlight
- Visual dominance,
- Restriction of view,
- Poor maintenance of barrier,
- Restricted access to the other side
- Loss of air circulation
- High investment costs

Imperfect solution

Silent brakes with PUCK segments



- + Active protection
- + Minor noise reduction
- According to ECHA: Environmentally unacceptable – heavy metals (Cu, Pb, Ni, Sn) and their oxides in the composition!
- High wear out of braking segments
- High LCC

Unacceptable solution

Anti-noise systems BREMEX ANNSYS „Basic“



- + Active protection
- + Complete reduction of high frequency braking noise
- + Prolonged lifetime of wagon's wheels and retarders
- + Low LCC
- + Environmentally friendly friction material
- + System is autonomic
- + With one device it is possible to supply more retarders

Only suitable solution

Research

Developed CHFC material (friction agent DBM-50) used in our research

- contains more than 40 % of solid particles
- is capable of taking over extremely high pressure loads
- is environmentally friendly

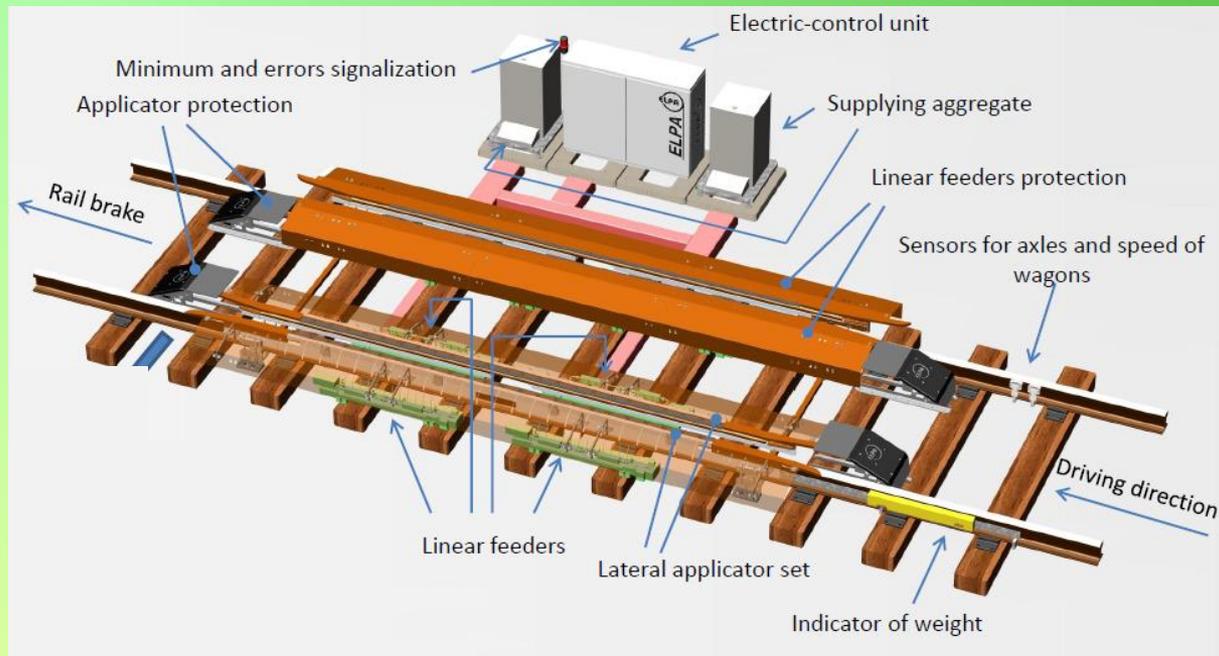
Appearance	Paste
Color	Gray
Odor	Mild
Solubility in water	Insoluble
Hazardous reactive properties	None
Consistency – NLGI (DIN 51818, ASTM-D 217)	2
Worked penetration (ISO 2137)	265-295 mm/10
Density (at 20 °C) (ISO 12185)	1.4 g/cm ³
Viscosity (at 40 °C)(ISO 3104)	26.5 mm ² /s
Flash point	> 300°C
Ignition temperature	> 350°C
Thermal decomposition	> 370°C
Drop point (ISO 2176)	Not applicable
Separation of base oil (40°C, 7 days) (DIN 51817)	0 %
Behavior of the product in the presence of water (DIN 51807-1-40)	< 1

Before using, the DBM-50 was tested according to numerous Standard methods and, according to these results and according to the characteristics of DBM-50 material, we had correctly presupposed that this material could be used efficiently.

Research

BREMEX ANSYSYS “Basic” anti-noise system

In our research we also developed a device which would be capable of distributing the new developed material directly onto the wheels, like a multipoint system.



The solution essentially comprises trackside sensors, electronics cabinets, reservoirs containing a composite material and special floating applicators that “capture” the wheels of the passing wagons. As the wagons pass the sensors, the sensors capture vital data based on the direction of the wheel, weight of the wagon and speed – this is transmitted directly to the electronics which are controlling the dosage.

Research

BREMEX ANSYS “Basic” anti-noise system

The applicators apply the environmentally friendly composite material directly onto the part of the wagon wheel flank being in contact with the rail brake. Timely and precise measuring of the applied material onto a wagon wheel creates an intermediate layer of material which is decomposed thermally in the braking process.



DBM-50 material

Research

BREMEX ANSYSYS “Basic” anti-noise system

System has been mounted also at German Railways (DB), within the Conjunction plan II (2009–2011): Less noise with new technology (*Konjunkturprogramm II: Weniger Lärm durch neue Technik*), where it achieved the best result among 13 technologies and 82 projects .



Research

BREMEX ANSYSYS “Basic” anti-noise system

The BREMEX ANSYSYS “Basic” device is suitable for all types of rail brakes (retarders) and it is usually placed at the rail before the brake/brakes. By using one device it is possible that more brakes are supplied simultaneously.



Marshaling yard Nürnberg (DB Netz AG)

Research

Noise reduction measurements

Measurements in this research were made in two measuring points at two marshalling yards, according to Standard method (EN ISO 3095, 2005).

The acoustic measurement program consisted of short-term measurements when a railroad composition passed by that railroad section.

The measurements had been made before and after implementation of BREMEX ANNSYS „Basic“ device.

RESULTS

Table: Noise reduction at the marshalling yard Brno Malomerice; Czech

Measuring point	Before the application*	After the application**	Difference
1 (dBA)	112.97 ± 4.97	87.35 ± 8.09	25.62
2 (dBA)	107 ± 4.23	84.77 ± 7.01	23.62

* Number of measurements: 18, ** Number of measurements: 29

RESULTS

Table: Noise reduction at the marshalling yard Zalog-Drca; Slovenia

Measuring point	Before the application*	After the application**	Difference
1 (dBA)	115 ± 5	85 ± 3	30
2 (dBA)	117 ± 4	84 ± 2	33

* Number of measurements: 4, ** Number of measurements: 5

CONCLUSIONS

The results have shown a high level of efficiency compared to other known solutions.

After the implementation of BREMEX ANNSYS “Basic” system the difference between the measurements before and after was on average more than 23 dB(A) for the first marshalling yard and on average more than 30 dB(A) for the second one.

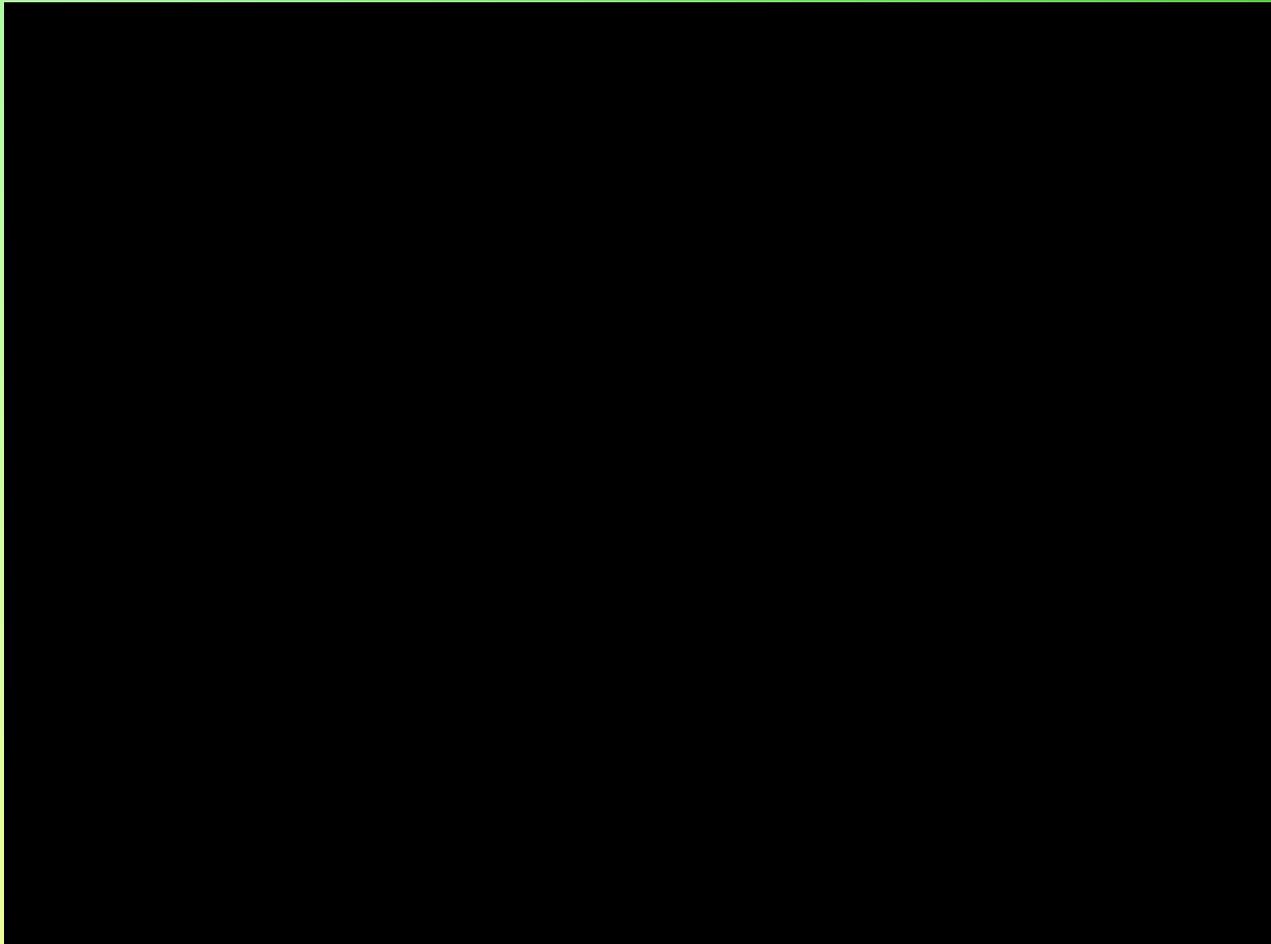
The main positive effects noticed were achieved as soon as devices had been installed.

CONCLUSIONS

The system BREMEX ANNSYS „Basic“ don't have any negative impact on the people's life or on the environment. On contrary, the noise pollution is notably lower and, consequently, quality of life is much better.

According to the results and feedback from end-users the potential of these system is very high.

Demonstration of noise reduction at some marshalling yards by using BREMEX ANNSYS „Basic“ system.



For more information, please contact us on:

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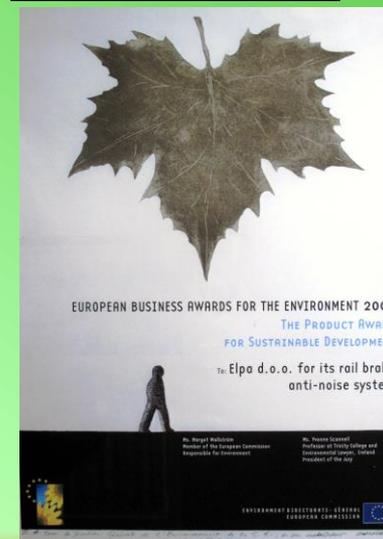
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UIC certifikate in 2012:



Prizeman in 2004:



Thank you for your attention !



– enjoy the silence !