

Squealing noise in curve can be removed

Measurement of noise reduction was performed at the two measuring points where the railway line makes a long sharp turn, therefore the direction of travel changes by approximately 180°. This railway is constructed with two lines which are spaced a certain distance from each other, where the left track is type S49 and the right track is type UIC 60. The first measuring point (MM1) was located 7 meters away from the first track at a height of 2 meters from the plane of the railway line. The second measuring point (MM2) was at a height of 4 meters and at a distance of 8 meters from the nearest track. The radius of curve in this part of the track is 298 meters. Measurements were carried out in the normal rail traffic continuously with modular sound detectors B & K 2250 and 2270 and with programmed modules.

During the research we determined the reduction of noise levels due to the use of special material - CHFC (Composite Heavy Fluid Compounds) material, which contains a high amount of solid particles. Application of CHFC material was automatic, by using the lubricating device CL-E1ws (application on the edge of the railhead) and by using anti-noise devices CL - E1 top (application on the top and on the edge of the rail head).

Measurements were performed three times: 1 when there were no installed devices, 2 when the lubrication device type CL - E1ws was installed and 3 when the anti-noise device type CL - E1 top was installed.

In the study we had, by using the anti-noise device CL-E1 top, achieved up to a 14 dBA noise reduction at low frequencies and up to a 30 dBA noise reduction at high-frequencies, as is evident from Figure 1 and 2. Minor noise reduction has also been achieved with the use of lubricating devices CL-E1ws, because the CHFC material applied to the edge of the track heads has reduced the vibration shocks and friction and, consequently, the noise level at low frequencies. The results of this analysis confirmed the hypothesis that, by using appropriate materials (CHFC materials) and technology (CL-E1top,) a very high reduction of high frequency noise can be achieved in the curve and with a load the noise is noticeably lower.

It is also important to point out that with applying the CHFC material on the side and on the top of the rail head would be possible to achieve almost total reduction of squealing noise and extremely high reduction of rolling noise, which gives exceptional added value to the material.

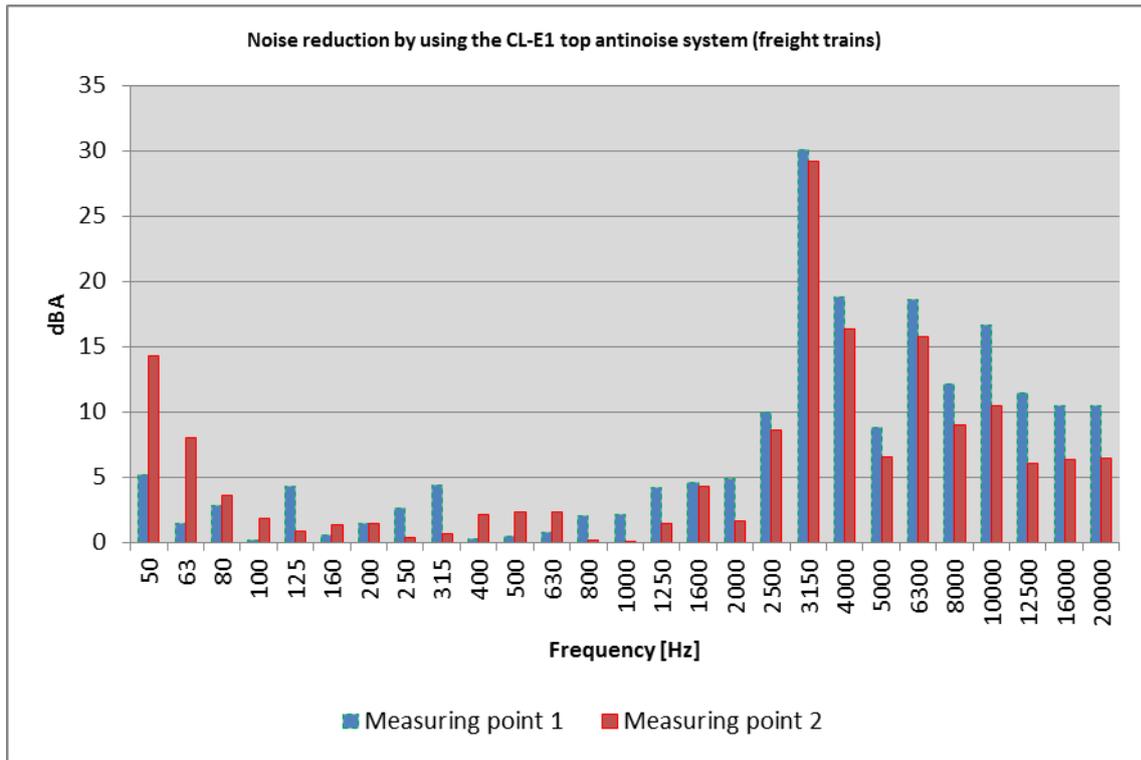


Figure 1: Noise reduction by using the CL-E1 top anti-noise system (passenger trains)

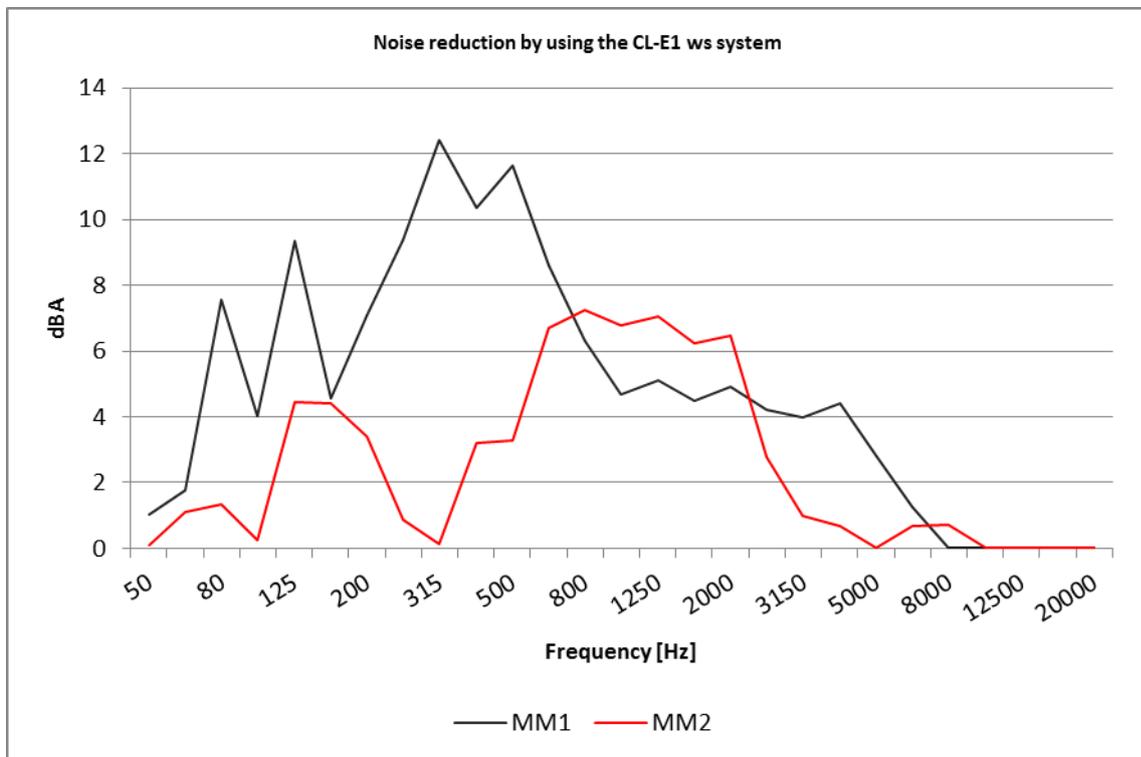


Figure 2: Noise reduction by using the CL-E1ws lubrication system (passenger trains)