

IMPROVING THE ACOUSTIC PERFORMANCE OF A SCHOOL GYM

Location: Budapest, Hungary

Product(s) used: Heraklith C, Tektalan

Building: School gym, Budapest

Client: The British International School of Budapest, General contractor: Menax kft. Budapest, Acoustic designer: Arató Akusztikai Kft.

“Following the gym refurbishment using Heraklith panels, both staff and students have remarked that the sports space is much quieter than before. Now two groups of students can enjoy activities at the same time in the gym without disturbing each other.”

- M. Karácsony, Chief Physical Education teacher



CEILING



INTERNAL WALL

Challenge:

The British International School has been teaching children from pre-school to secondary level since 2004 in a peaceful district of Budapest's District III. Despite enjoying sophisticated, modern facilities, the school's gym - 535 m² with a cubic content of 4,800 m³ - required renovation due to severe acoustic problems caused by its shape and design. During PE classes students could barely hear teachers' instructions; activities were unnecessarily noisy due to echo and it was difficult to hear what was being said during school events held in the gym. The school management resolved to solve the gym's acoustic challenges over the 2015 summer holiday.

Solution:



ACOUSTIC



FIRE SAFE



ECO-FRIENDLY



THERMAL



DURABLE

Acoustic analysis by Arató Akusztikai Kft. revealed extremely bad values in the gym's 500 to 1,000 Hz frequency range leading to poor speech intelligibility as well as a reverberation time of 2.88 seconds which caused repeated rattling echoes. Contractor Menax Kft chose white Heraklith C (35mm) for the walls and Tektalan (50mm) for the roof. The wood wool insulation panels were not only ideal for improving sound absorption but as they are impact resistant and aesthetically pleasing they could also be used as a visible surface.

The first step was to install 50mm self-coloured Tektalan boards into the gaps of the braced roof girders to reduce the number of shiny surfaces. This was followed by covering wall surfaces with factory-painted white 35mm wood wool boards that had been fixed onto 80 mm joists with mineral wool inserted between them. With this solution, the weighted sound absorption of the board increased from $\alpha_w=0.35$ to $\alpha_w=0.85$ ($\alpha_w=1=100\%$ complete sound absorption). Furthermore the surface was impact resistant in line with European standard EN13964 : 2004 Suspended Ceilings making it ideal for sports games and exercises.



Following the renovation the contractors carried out acoustic tests to examine the extent of the sound improvement. The rattling echo had been stopped with the reverberation time reduced to 1.53 seconds - almost half the original value - and the gym had improved from the 'bad' to 'good' category in the Room Acoustics Speech Transmission Index. Additionally, voice purity had improved to a value of about 2 dB, which is considered good in the case of a room used for speeches.



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