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Advanced acoustical material tuned for low frequency noise
reduction: a case study

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Low frequency noise is a significant annoyance at very low amplitudes, particularly when outdoor community noise from mechanical equipment penetrates commercial and residential building structures. Mid and high frequencies are selectively attenuated by the exterior walls. However, mitigation of the low frequency noise has been very challenging due to the longer wavelength and higher energy. This work presents case studies of an advanced acoustical material in typical metal panels to mitigate community noise from outdoor mechanical equipment. These advanced materials were developed with a unique combination of patented acoustical and vibration absorbing technology, based of distributed absorbers, layered with standard acoustic materials. The materials provide enhanced low frequency noise (below 300 Hz) over state of the art 10 cm metal panels filled with the fiberglass absorber. The case studies demonstrate superior acoustic performance in low frequency without substantial increase in weight.