Anechoic chamber

Anechoic Chamber What is it for? This is a room which is acoustically like being high above the ground in the open air because there are no reflections from the walls, floor or ceiling. This means it is ideal for testing the response of loudspeakers or microphones because the room doesn’t affect the measurements. It is also the best place for virtual acoustics - generating auralisations of concert halls, city streets and other spaces. The anechoic chamber is immensely quiet which makes it ideal for testing very quiet products or people hearing very quiet sounds. Example application Final year project student, Patrick Froment wanted to simulate the sound of rain on roofs. He needed to measure the sound of a single raindrop landing on a roof section without the effect of a room, so he used the anechoic chamber. He also needed a very quiet acoustic to measure the sound. Example application The protection that ear muffs and earplugs provide varies from person to person, so they need to be tested on real people. To do this four loudspeakers are placed at the corners of a tetrahedron and a person sits so their head is at the centre. The loudspeakers then produce sounds that are used to test the person’s hearing threshold — the method is very similar to how your doctor might test your hearing. The threshold is tested with and without the hearing protectors, and the difference gives the product’s performance. If you buy some ear plugs from a DIY store, the chances are that the performance was tested in our chamber. How is it made? We need to prevent sound getting into the room, and this can pass through the walls, or through the foundations of the building. The background noise level in the chamber is immensely low; this is probably the quietest place you’ll ever experience. e anechoic chamber is actually a room, within a room, within the Newton building. The walls, floor and ceiling of the inner chamber are made

of heavy Accrington brick and concrete to prevent sound getting into the room. Two heavy acoustic doors with rubber seals are used to minimise airborne sound. Careful design is needed to deal with structure-borne sound, for example, vibrations through the foundations. The whole inner chamber is mounted on a set of springs - neoprene rubber mounts - to reduce vibration, as is done for major concert halls, but this chamber is very much quieter than even the grandest auditorium. The design is very exacting, for instance the bridge leading into the chamber is attached to the outer but not to the inner wall, to prevent the vibration isolation being bypassed. To remove reflections from the walls of the chamber, every surface is covered in absorbing materials. The inside of the chamber is lined with foam wedges to absorb sound; this includes the floor. The floor you walk on is a wire trampoline stretched between the walls with an acoustically transparent catch net below. The wire floor is safe, but you shouldn’t enter if you are wearing high heels! Vital statistics * Background noise level -12. 4dBA * Working area 5. 4 x 4. 1 x 3. 3m * Cut-off frequency 100Hz See the virtual tour of the anechoic chamber. Common measurement procedures offered commerically * Measurement of sound attenuation of hearing protectors to BS EN 24869-1: 1993 / ISO 4869-1: 1990 (UKAS Accredited) * Sound power level measurement to BS ISO 3744: 1994 / ISO 3744: 1994 and BS 4196: 1981 / ISO 3745: 1997 * Air Conduction audiometry to BS 6655: 1986 / ISO 6189: 1983 * Hearing protector measurements to AS 1270: 1988 (UKAS Accredited) * Measurement of the characteristics of loudspeakers to BS 6840 Pt 5: 1995 / IEC 268-5: 1989 * Measurement of sound power levels to BS 4196