



Evacuated bell jars: implosion risk

A very popular demonstration shows the sound dying away as a bell jar containing an electric buzzer or bell is evacuated. The base of the bell jar is usually sealed with a thick sheet of glass. Whilst the experiment is relatively safe if a hand pump is used to evacuate the apparatus (since the pressure is unlikely to drop below about 10 cm Hg), there is a serious risk of implosion if electrically operated rotary pumps or water pumps are used, since even the latter can reduce the pressure down to 1.5 cm Hg, giving a pressure difference of 99 kNm⁻². The glass sheet often breaks, and it should be noted that suppliers' catalogues often state that the bell jars are not suitable for evacuation. Special pressure vessels are available, but are expensive. If this traditional experiment is to continue it is essential that both teacher and pupils be protected by plastic safety screens. Very recently, glassware coated with a tough plastic film has come on to the market, and it may well be that coated bell jars will provide a satisfactory solution to the problem.

Note: The pressure 99 kNm⁻² is now written 99 kPa.