

Sound

The measurement of unsteady acoustic pressures associated with sound can be particularly difficult not only because the transducers (microphones or hydrophones) may have a calibration that is frequency-dependent but also because the calibration may be directionally sensitive. Therefore acoustic transducers come not only with frequency calibrations but also with directional charts indicating the dependence of the sensitivity on the direction of approach of the sound. Some acoustic transducers or hydrophones are designed to be relatively free of this directional sensitivity though this can be difficult to achieve at high frequencies.

Another serious complication is that the sound from a flow in a tunnel or container will depend on the reverberation in that environment. Air flow measurements are therefore usually conducted in large anechoic chambers whose internal surfaces are designed to be minimally reflective of sound. Alternatively, when measuring single events, the walls should be far enough away that reflected sound does not reach the transducer during the measurement period. Water tunnel experiments whose purpose is to measure the sound generated by cavitation are notoriously facility dependent and difficult to interpret for these reasons.