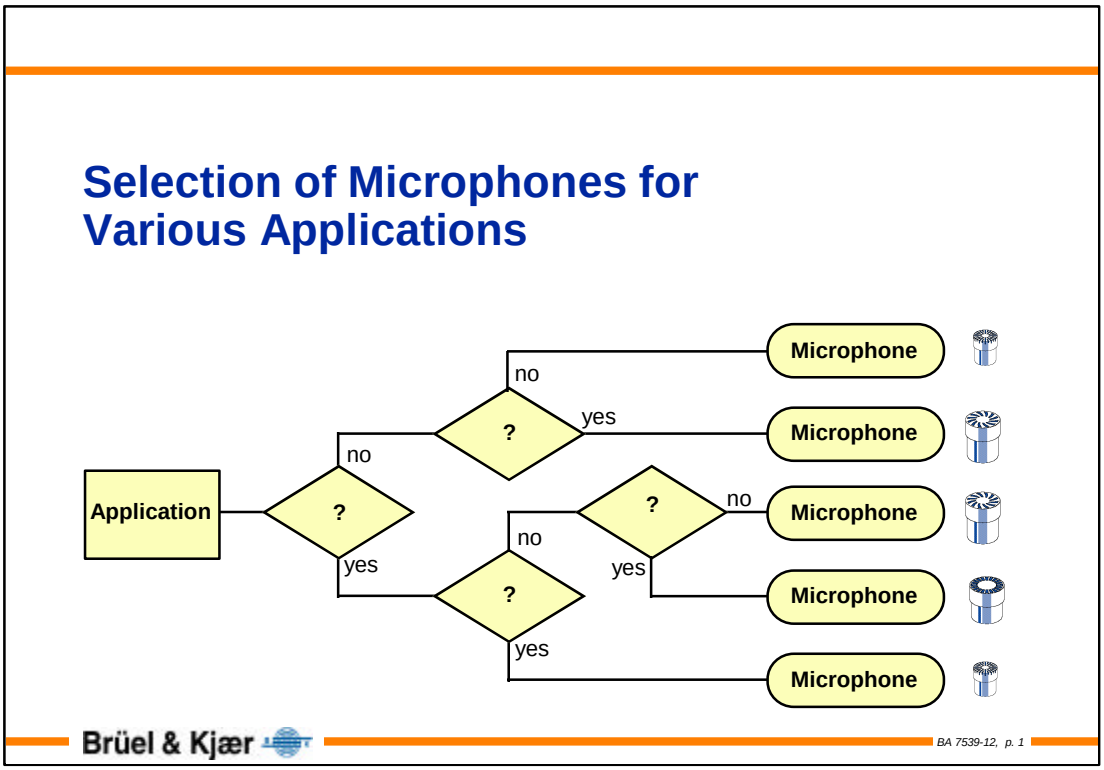
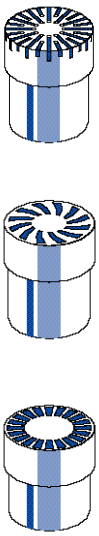


Abstract

The aim of this lecture note is to optimise the selection of a microphone for a particular application. The selection process starts with the application and after a small number of decisions, leads to a recommended microphone.

Applications Dealt with by Selection Guide



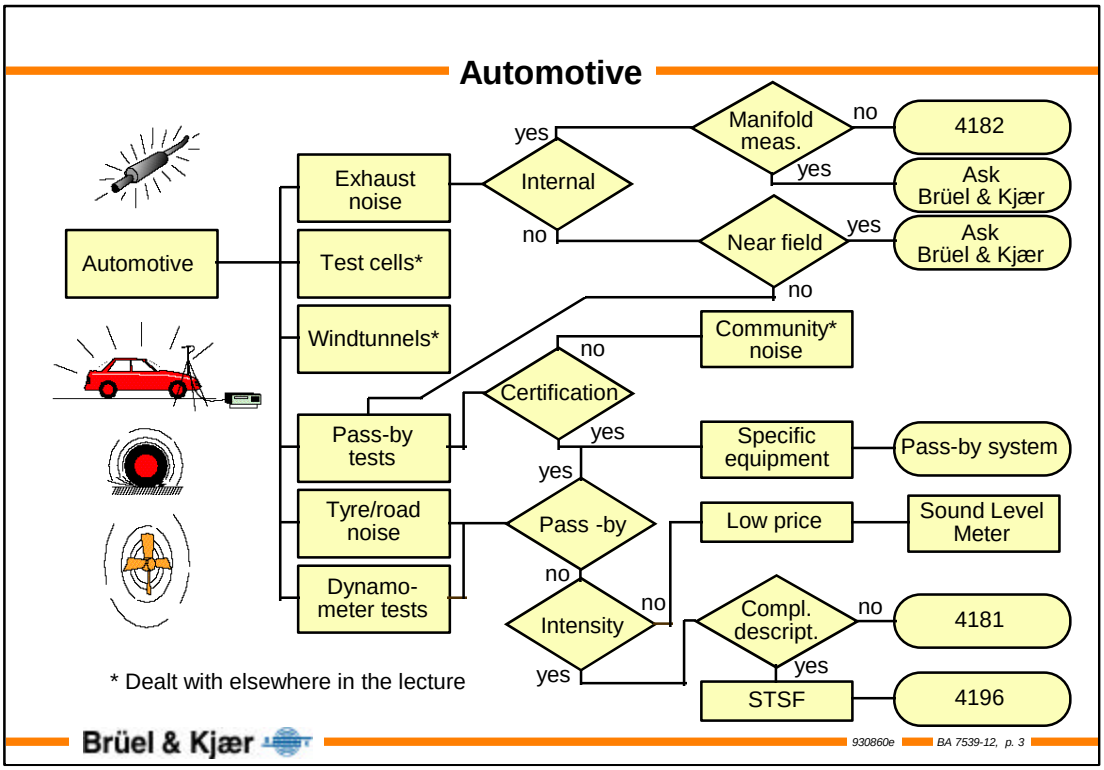
- Automotive
- Engine test cells
- Industrial vehicle certification
- Community noise
- Aircraft noise certification
- Industrial machinery
- General electroacoustics
- Speech intelligibility
- Diskdrives, ventilators in PCs
- Acoustical transducers
- Office and household machinery
- Explosions and rockets
- Windtunnels
- Acoustical couplers
- Calibration
- Sonic booms and infrasound
- Acoustical modelling

Brüel & Kjær 930859e BA 7539-12, p. 2

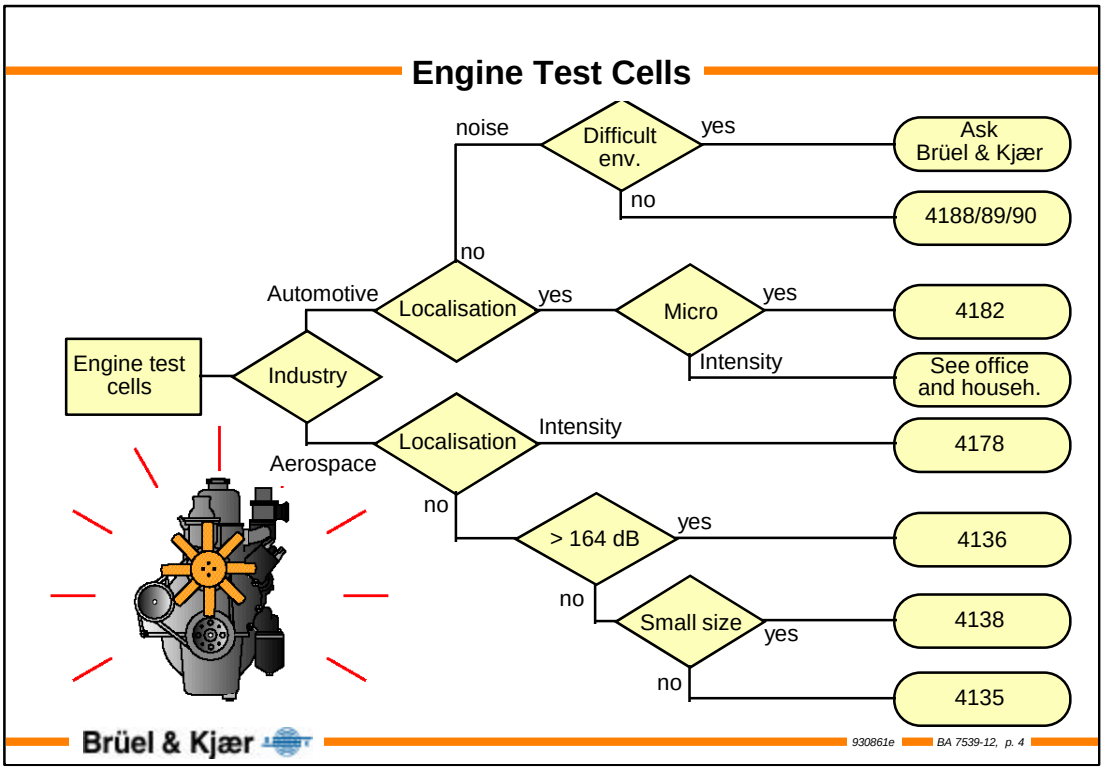
Introduction

The selection guides are somewhat simplified and some specifications will need to be checked after their use. For special applications further information can be found in the Short Form Catalogue, the Microphone Handbook “For the Falcon™ Range of Microphone Products” (BA5105), Data Handbook “Condenser Microphones and Microphone Preamplifiers for Acoustic Measurements” and Lecture Note “Measuring Microphones” (BA 7216). If you cannot see a microphone to suit your application, then contact your local Brüel & Kjær representative stating the application, the desired frequency range, the dynamic range, the environmental conditions etc.

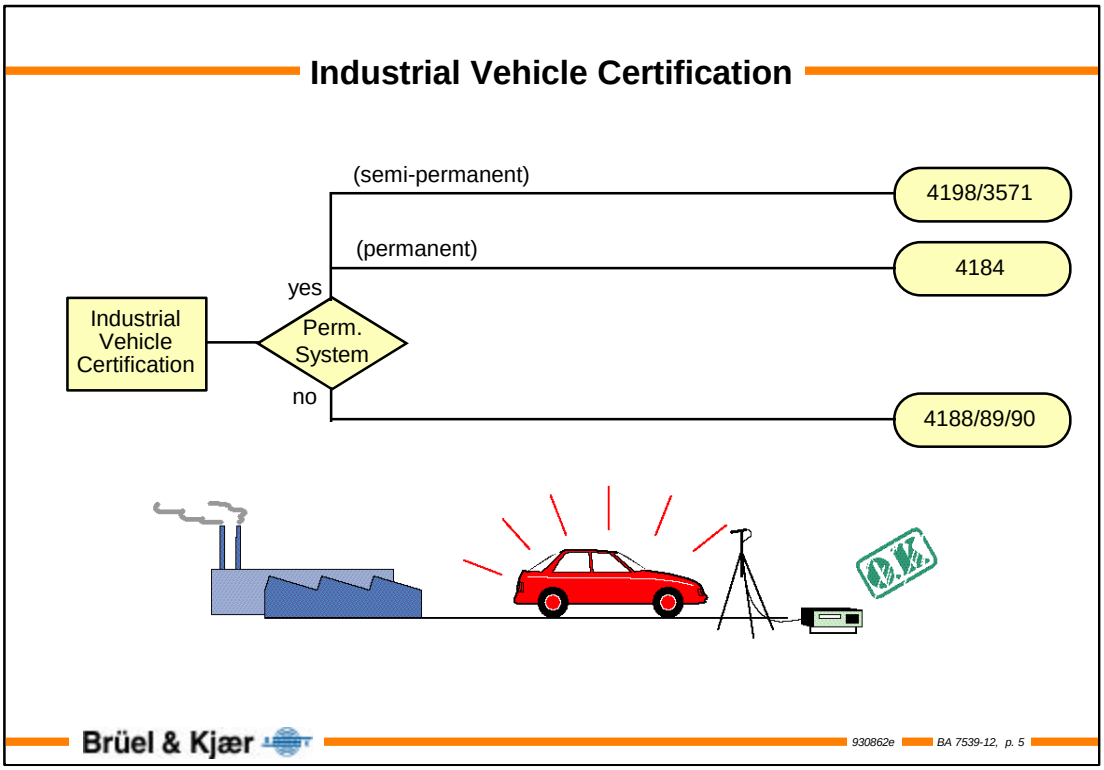
An asterisk in the selection guides means that the application is dealt with elsewhere in the lecture note.



For pass-by testing, contact Industrial Measurement Sector for information of the Pass-by Measurement System which includes information on the selection of microphones.



The choice between microphones 4188/89/90 depends upon the requirements for frequency range, polarisation voltage and sensitivity.

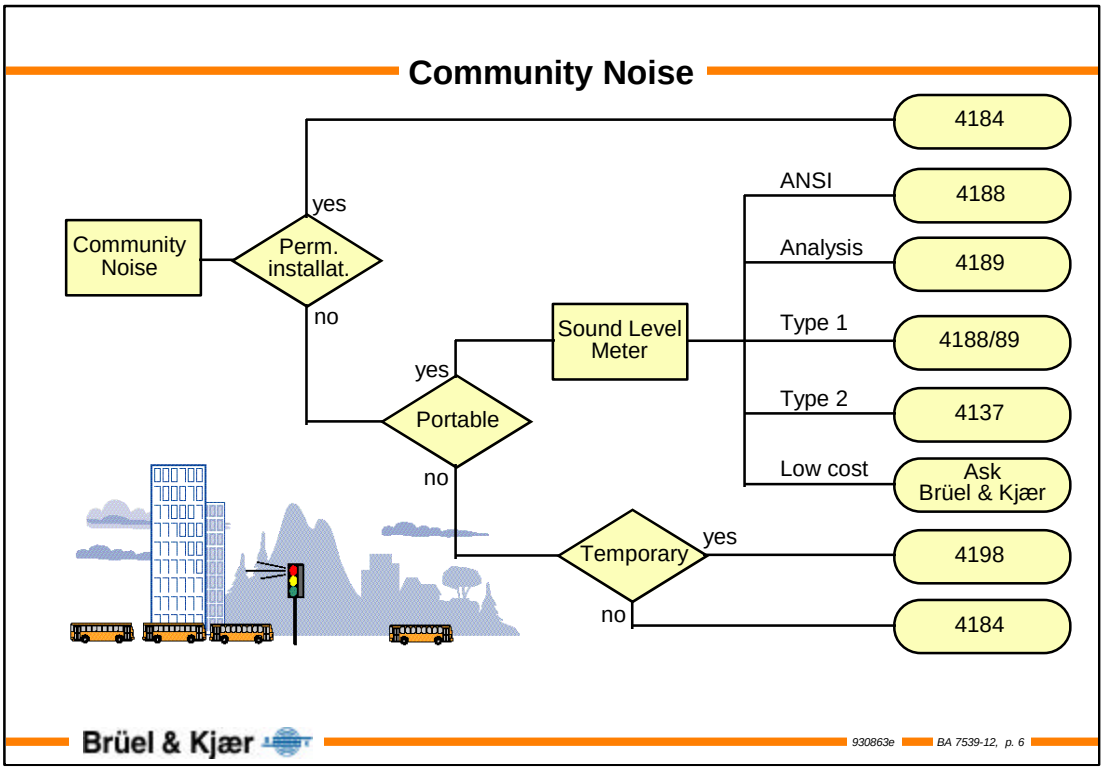


The outdoor microphone unit Type 4198 has the advantage of being very flexible, easy to calibrate and it can be connected to existing power supplies.

Type 3571 is a complete outdoor microphone measurement system based on Sound Level Meter Type 2236. The entire system is contained in a tamper-proof box equipped with a mast for the microphone.

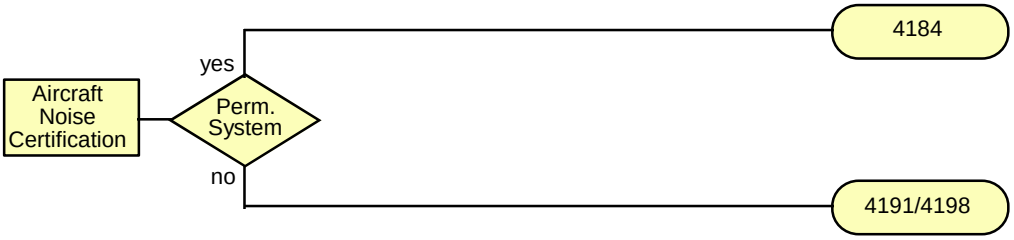
Outdoor Microphone Type 4184 is to be preferred in permanent installations.

The choice between microphones 4188/89/90 depends upon the requirements for frequency range, polarisation voltage and sensitivity.



The outdoor microphone unit Type 4198 has the advantage of being very flexible, easy to calibrate and it can be connected to existing power supplies.

Aircraft Noise Certification

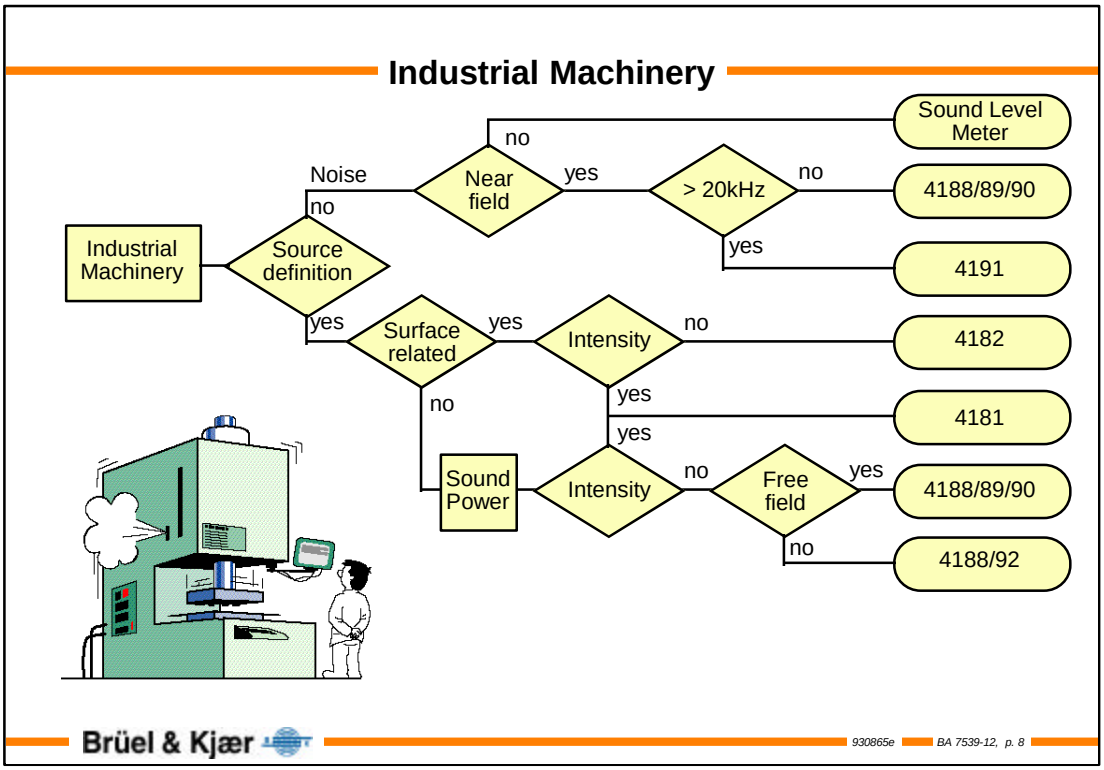


Brüel & Kjær

930864e BA 7539-12, p. 7

Microphones 4184 and 4191 have the same sensitivity, so both microphones can be used with Noise Level Analyzer Type 4435 with the same settings.

The outdoor microphone unit Type 4198 has the advantage of being very flexible, easy to calibrate and it can be connected to existing power supplies.



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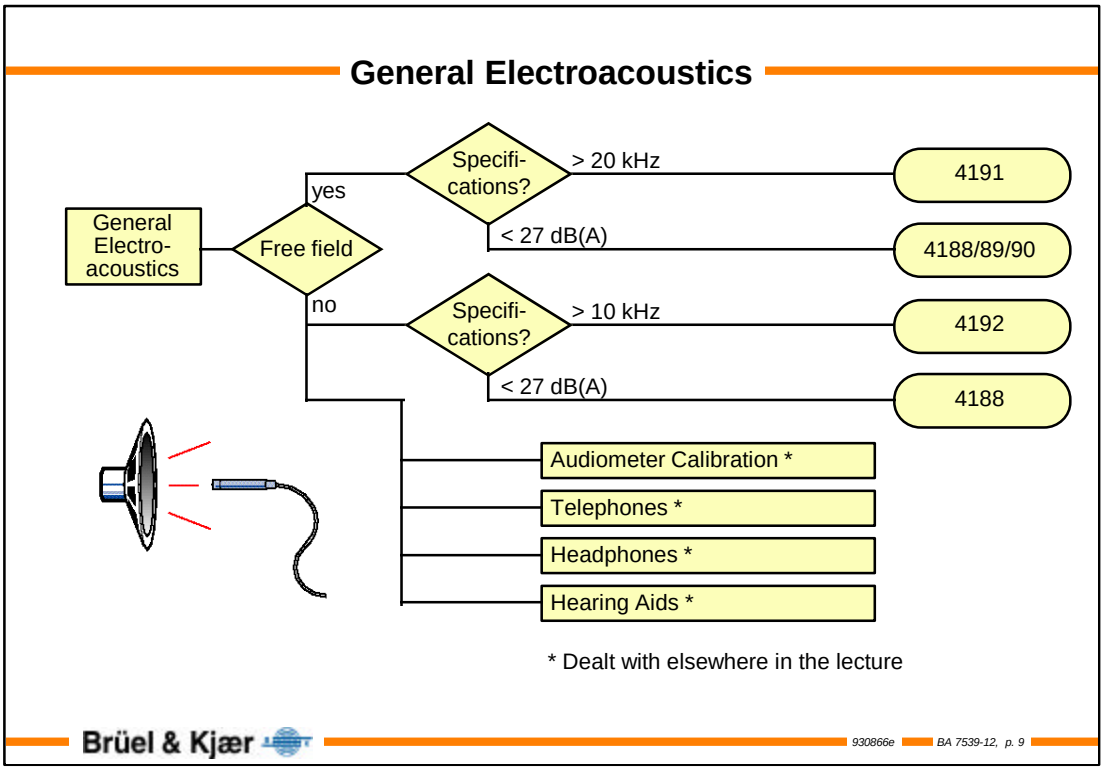
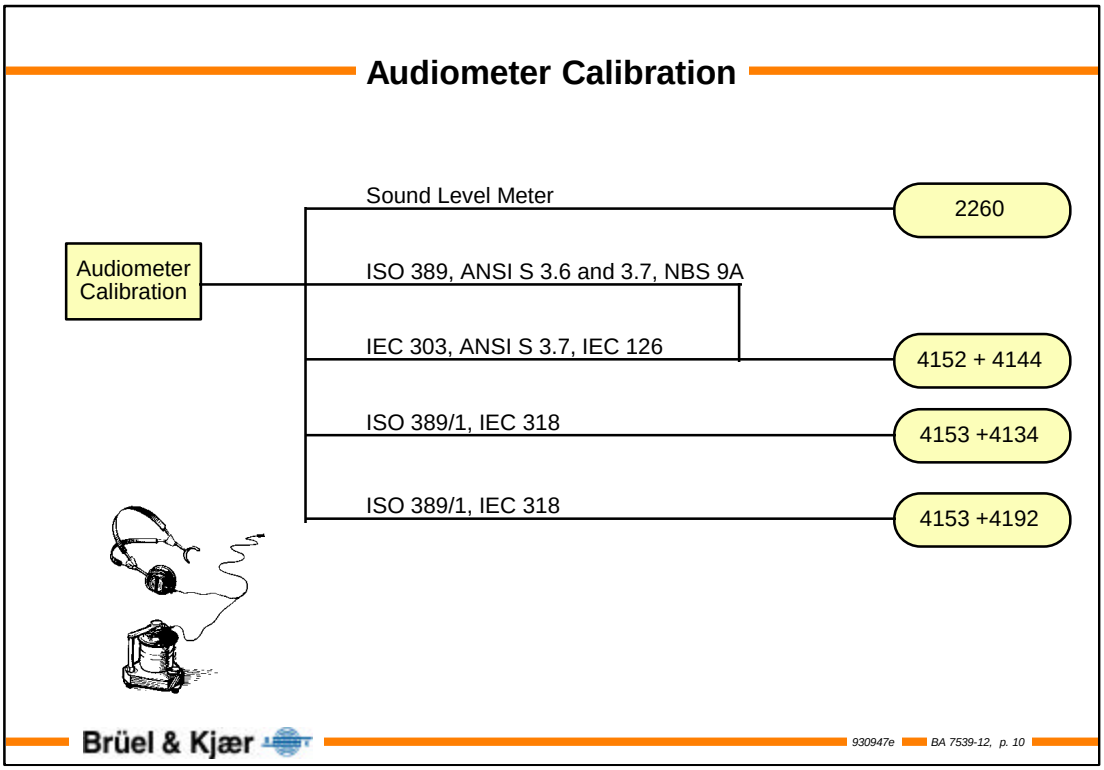
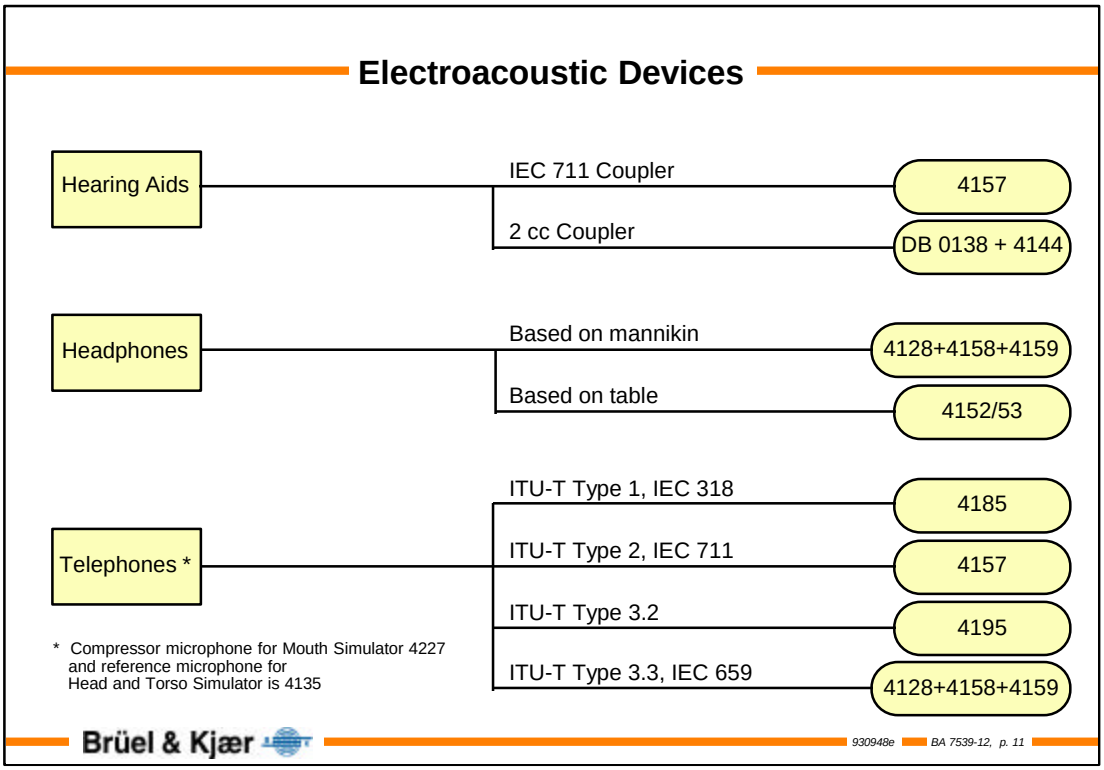


The choice between microphones 4188/89/90 depends upon the requirements for frequency range, polarisation voltage and sensitivity.



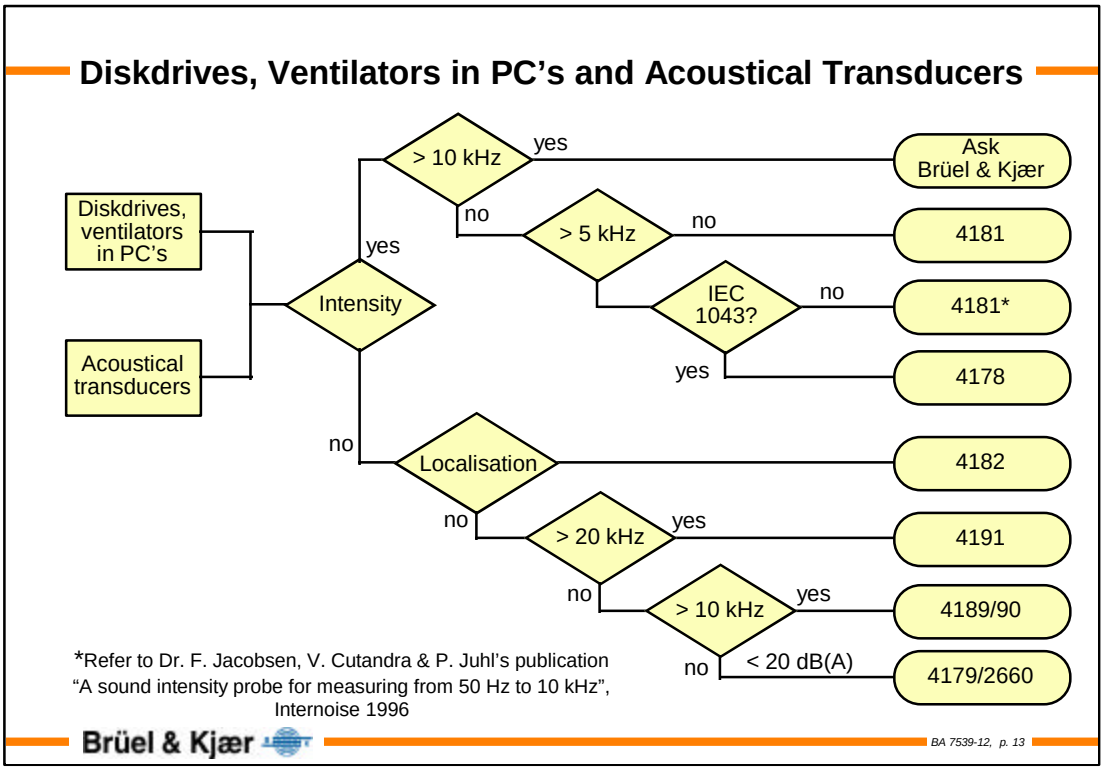
Analyzer based systems are also available based on, for example, Audio Analyzer Type 2012.



Hearing aids: After choosing the coupler, use either Anechoic Test Chamber Type 4222 or Anechoic Test Box Type 4232.

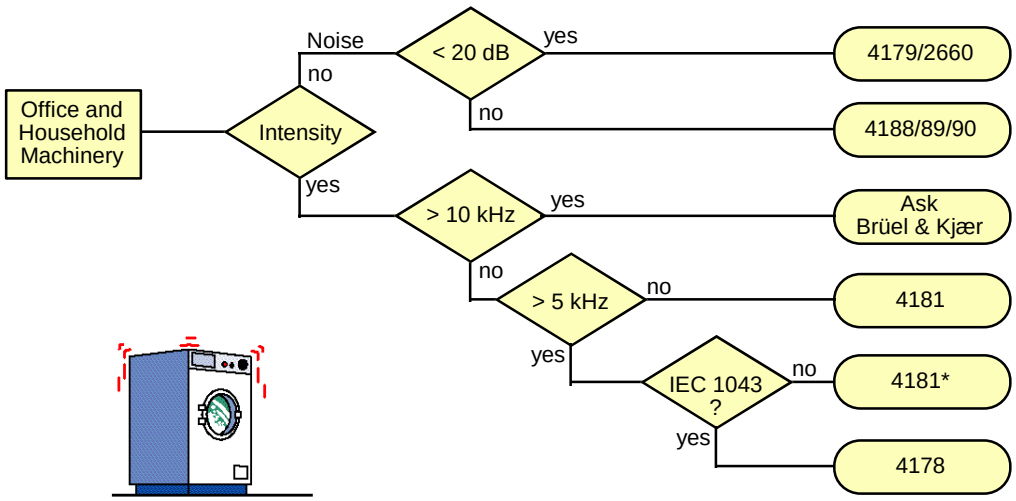
Speech Intelligibility

Speech Intelligibility — RASTI — 4130



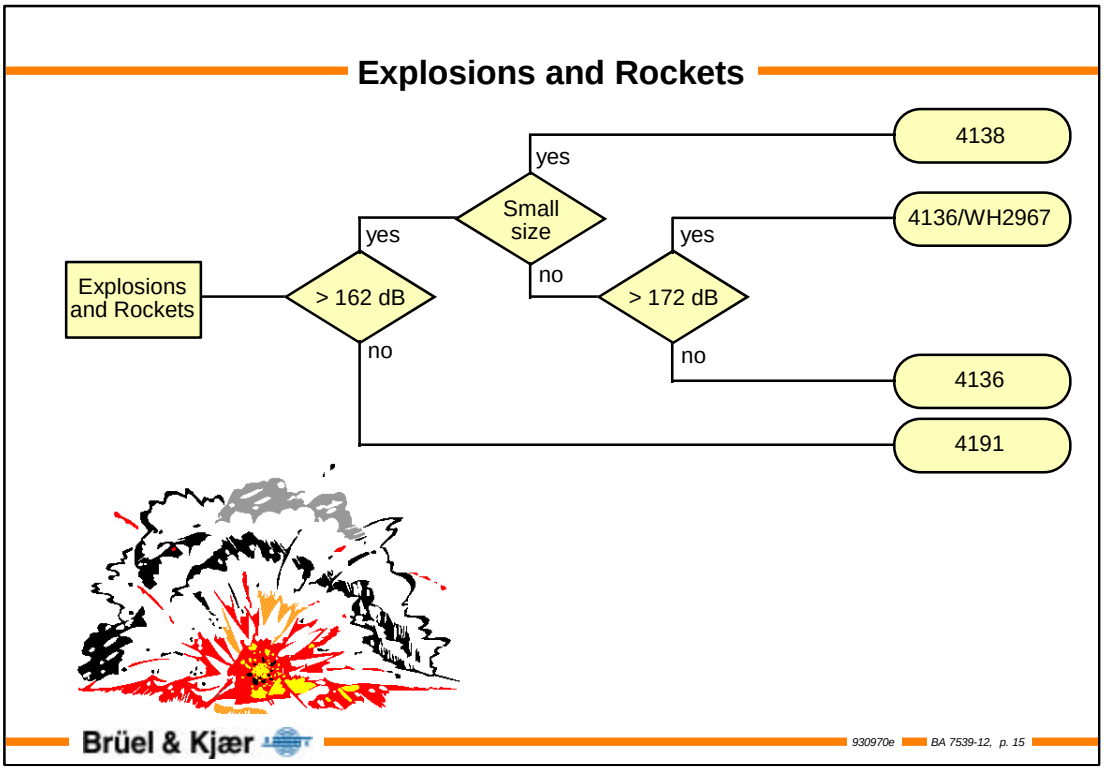
Intensity Probe Type 3584 contains Microphone Pair Type 4181 while Intensity Probe Type 3583 contains Microphone Pair Type 4178&4181.

Office and Household Machinery

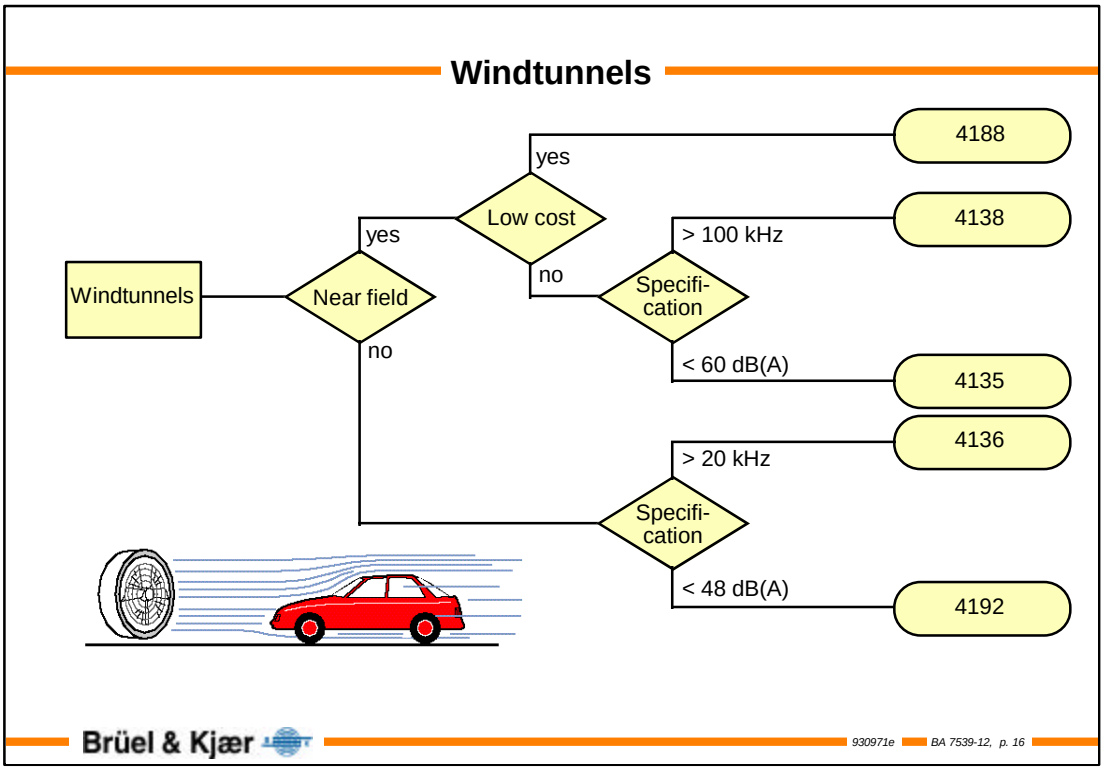


*Refer to Dr. F. Jacobsen, V. Cutandra & P. Juhl's publication "A sound intensity probe for measuring from 50 Hz to 10 kHz", Internoise 1996

The choice between microphones 4188/89/90 depends upon the requirements for frequency range, polarisation voltage and sensitivity.



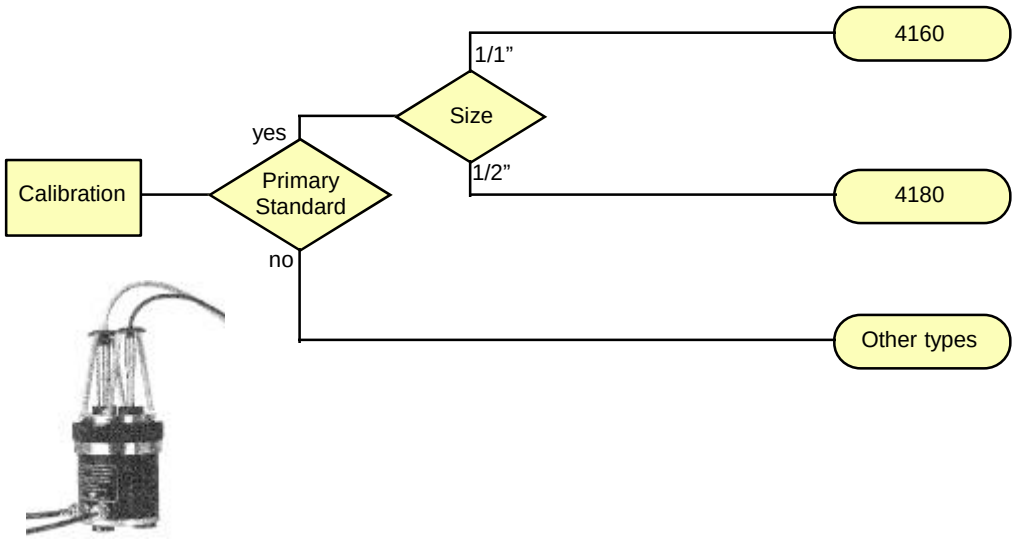
The levels mentioned are 3% distortion levels.



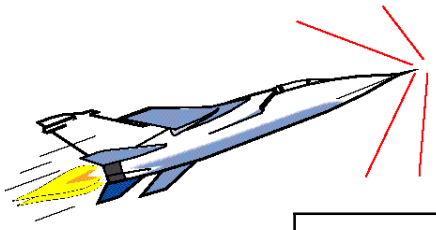
Other points to consider in windtunnel measurements are:

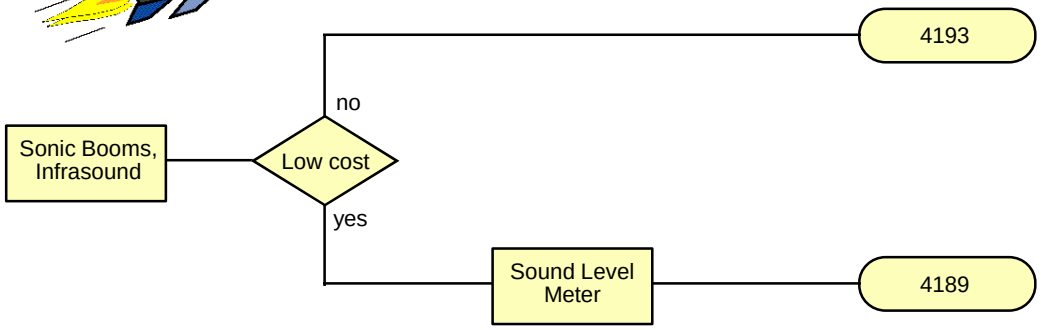
- Should Nose Cones be used?
- Should a microphone array based on Microphone Type 4196 be used?
- Do wind shields need to be used?

Calibration

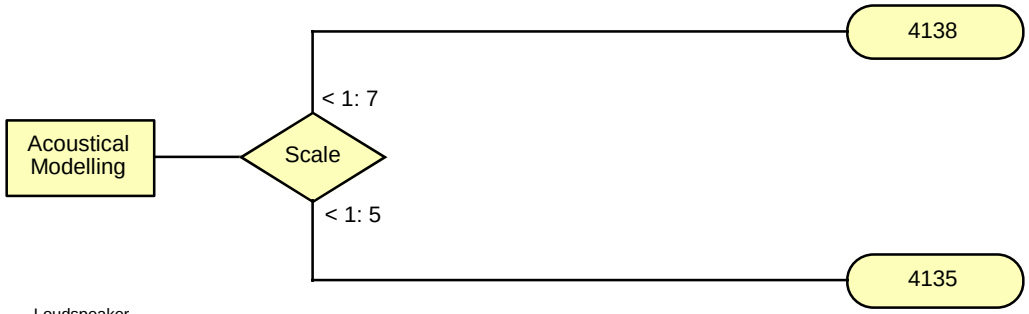


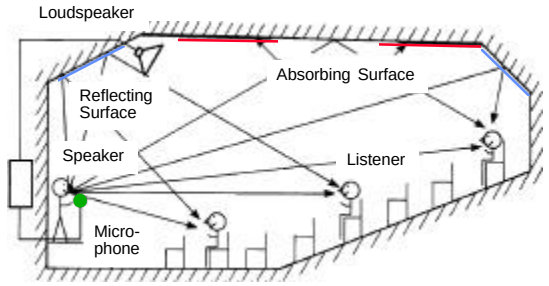
Sonic Booms and Infrasound

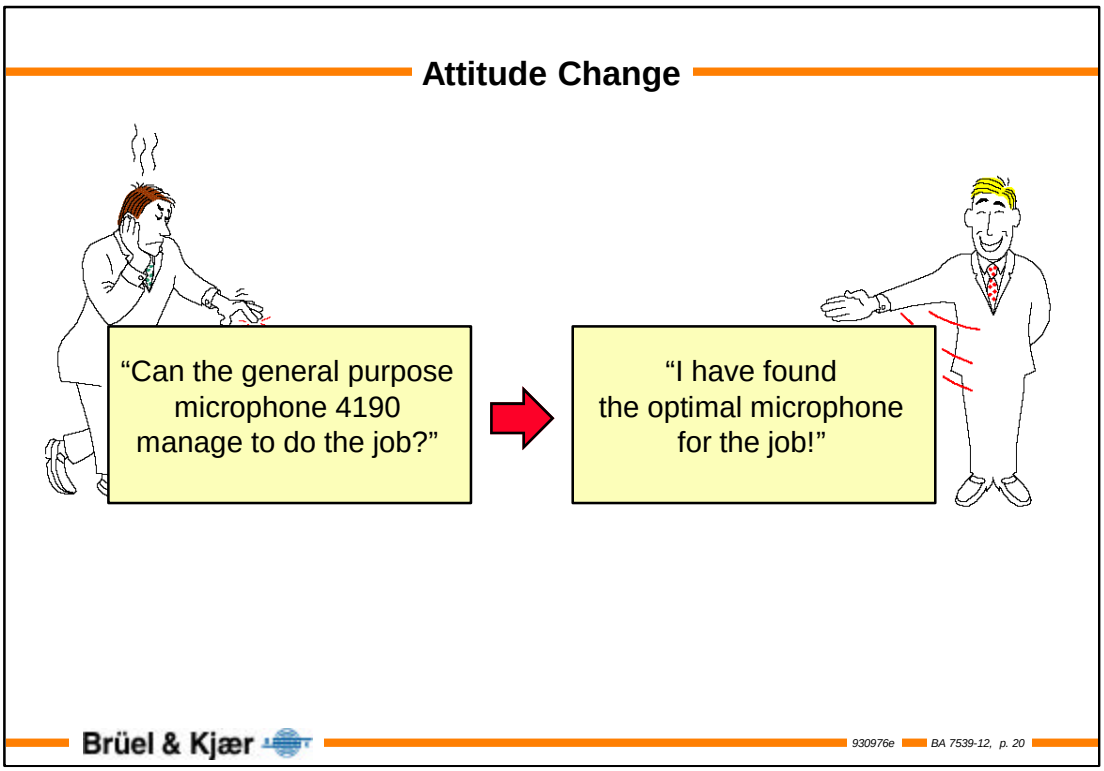




Acoustical Modelling







Conclusion

Order of priority:

1. Select the optimal microphone for the job.
2. If conditions are not specified, select a general purpose microphone for the job.