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### **Measurement of SEA damping loss factor for complex structures**

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Statistical Energy Analysis has become extremely popular in the transportation industry. As a prediction tool, it offers appealing advantages such as its wide frequency range and short computational time, which conventional methods do not offer. Critical parameter in every SEA model, the damping characteristics of the subsystems must be determined by way of experimentations. A variety of different techniques of measuring the damping loss factor were developed. These techniques can be divided into three main groups: (i) method based on the identification of modal damping by curve-fitting frequency response function, (ii) decay techniques based on-determination of the reverberation time and, (iii) steady-state techniques involving measurements of power input method much closely related to the definition of SEA since its starting point is the power balance. This work presents an experimental study of these techniques for various structures such as flat metallic panels, aircraft side walls (ribbed curved panels) and sandwich-composite panels in both low and high damping configurations (additions of damping materials, sound packages in both single wall and double wall configurations, mounting effects, ...). In particular, a critical discussion is made on the implementation, advantages and drawbacks of each method regarding its use in SEA modeling of complex structures.