

MICROFLOWN SCAN & PAINT TPA (TRANSFER PATH ANALYSIS)

Ratkaisu Transfer Path Analysis mittauksiin

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Tuotenumero:	
Tyyppi:	Near Field Particle Velocity + Sound Pressure

The enabling of airborne transfer path analysis provides you not only inside of the sound source locations but also how they are contributing to a defined position. Providing a fast, high spatial resolution tool for e.g. a ranking of the noisiest areas of a cavity interior from the perspective of listener such as the driver.

A high velocity at the surface does not necessary mean a high pressure contribution to a certain position. In a complex environment such as a vehicle interior, the surface velocity can only give an indication about the source ranking of different areas. Traditionally transfer path analysis (TPA) offer a solution to rank sources but requires a multichannel frontend system with multiple sensors. An advanced version of the traditional Scan & Paint, called Scan & Paint TPA, is a solution for airborne TPA. This system introduces a fast method and requires a low number of channels. The Scan & Paint TPA not only maps the surfaces' source strengths, but transfer functions and phase references as well. This opens the option to preserve relative phase information between various measurement positions and their contributions to a defined location. All this with only 3 channels (two sensors solution) and an omnidirectional sound sources or orientation.

The pressure (referred to certain position) can be calculated in two measurement steps by Scan & Paint TPA:

- Velocity distribution over the surface
- FRF Transfer functions using reciprocal measurements with sweep method

Step 1: Similar to the standard Scan & Paint the source strength in operational conditions is measured by scanning the surface with a PU probe. The difference with the TPA version is that now a reference microphone is added at a defined position to have the phase correlation different surface velocities.

Step 2: The transfer function is measured in a reciprocal way. This means a monopole sound source is positioned at the listener position and the sound pressure is measured over the surface with the same method as Scan & Paint (sweep method) to have the transfer function to each position as were the source strength has been measured. The cross-spectrum between particle velocity at the surface and the pressure at the reference position is calculated and contains the relative phase information between the panel vibration and pressure at the reference position.

The airborne TPA is performed to evaluate and rank the contributions from different sound sources. The measurement versus synthesis (SPL vs Sum of contributions) validation is included in the Scan & Paint TPA.

Additional required items to Scan & Paint to complete a TPA compatible system:

- Scan & Paint TPA software module
- Monopole sound source
- Reference microphone



<https://www.youtube.com/watch?v=0RIj-g4rsOs>