

## ACOUSTICS2008/1681 Evaluation of Metrics for Field Airborne Sound Isolation

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ASTM E336 and ISO 140 define several metrics describing airborne sound isolation for field measurements of wall and floor/ceiling assemblies. The current standards include provisions for the measurements of an apparent sound power reduction (ASTC and  $R'_w$ ), a non-normalized noise reduction (NIC and  $D_{n,w}$ ), and a normalized noise reduction (NNIC and  $D_{nT,w}$ ). In a previous paper [LoVerde and Dong, *J. Acoust. Soc. Am.* 119, 3219 (2006)], the relationships between these metrics were reviewed. The desired metric for isolation in residential uses is discussed, specifically whether it should be based on sound power and related to the performance of the partition system (ASTC and  $R'_w$ ), or based on sound pressure and related to the acoustic isolation between spaces (NNIC or NIC or ISO equivalents). The analysis indicates that the sound pressure-based metric is preferred. Since power and pressure-based airborne sound metrics have small differences in field tested assemblies in most cases, it appears engineers have assumed that ASTC (and  $R'_w$ ) correlates with isolation. Field tests where this assumption does not hold are presented. In these cases, the power metric provides an inaccurate assessment of the acoustic isolation and can lead to engineering evaluations inconsistent with actual performance.