

# **Exploring Advanced Ultrasonic Inspection Techniques and Assessing Their Imaging and Sizing Capabilities**

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In recent years, there has been significant advancements in portable ultrasonic techniques such as the introduction of newer data collection methods like full matrix capture (FMC) and plane wave imaging (PWI), as well as advanced data processing algorithms like the total focusing method (TFM) and phase coherence imaging (PCI). These techniques are gaining recognition within the industry for their enhanced imaging and sizing capabilities over the traditional Ultrasonic Testing (UT) and Phased Array Ultrasonic Testing (PAUT). However, like any ultrasonic testing (UT) method, these advanced inspection techniques are governed by the same fundamental laws of physics, and their performance relies on the input parameters used. The accuracy of results can also be affected by the properties of test component such as material composition, geometry/access etc. From physical probe characteristics to the choice wavesets for image reconstruction, a vast array of variables must be optimized to extract the best results. Therefore, a thorough understanding of the variables and operational limitations associated with these methods is essential for using them in practical applications. This presentation aims to provide a comprehensive comparison and analysis of the key parameters involved and their effect on imaging and sizing capabilities when compared to traditional focused phased array ultrasonic inspection.