

# Enhanced microwave absorption of rice husk-based pyramidal microwave absorber with different lossy base layer

## **Abstract**

The size of pyramidal microwave absorbers (PMA) is one of the main considerations for their selection for use in anechoic chambers. In this work, a new type of PMA is introduced, with rice husk (RH) as its filler. Meanwhile, a lossy base layer is also introduced in the PMA using a combined RH and carbon nanotube (CNT) composite. To do so, the dielectric properties of the RH-CNT composite are first investigated from 2-18 GHz by using a dielectric probe. Next, the microwave absorption properties of the PMA were investigated in terms of different height of the pyramidal structure and base layer. The free-space method was used to measure the microwave absorption of PMA at oblique incident angles of  $0^\circ$  to  $60^\circ$ , respectively. Results indicated good microwave absorption characteristics in the 2-6 GHz with a height of 11.5 cm the PMA structure, and 1 cm thickness of the base layer. The lossy base layer is found to increase the bandwidth of the absorber and improve the microwave absorption of PMA in the lower GHz frequencies. Further investigations concluded that the microwave absorption performance of the PMA is dependent on its dielectric properties, size and base layer.