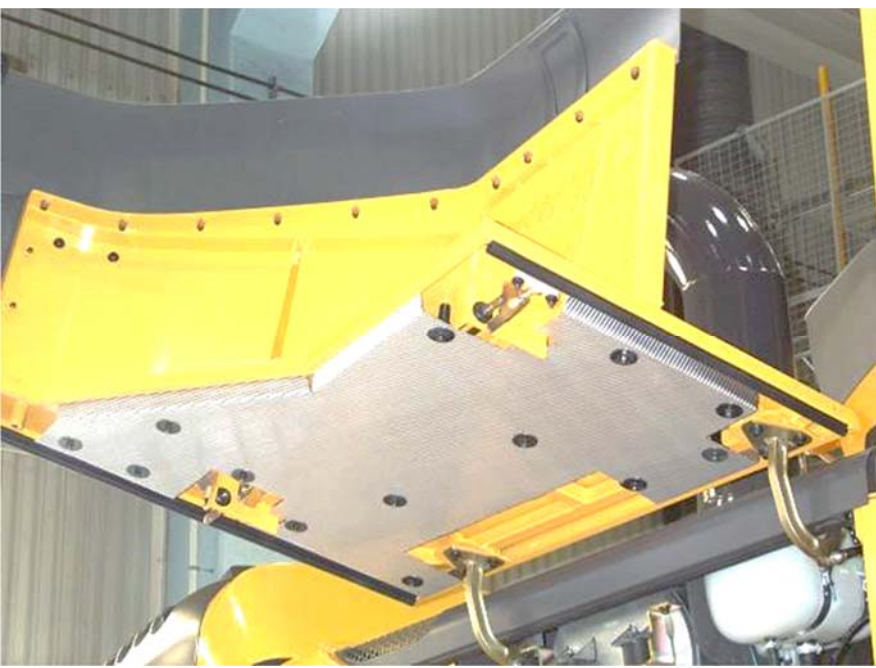




Micro-perforated Sound Absorbing Materials

Dr. Paresh Shravage

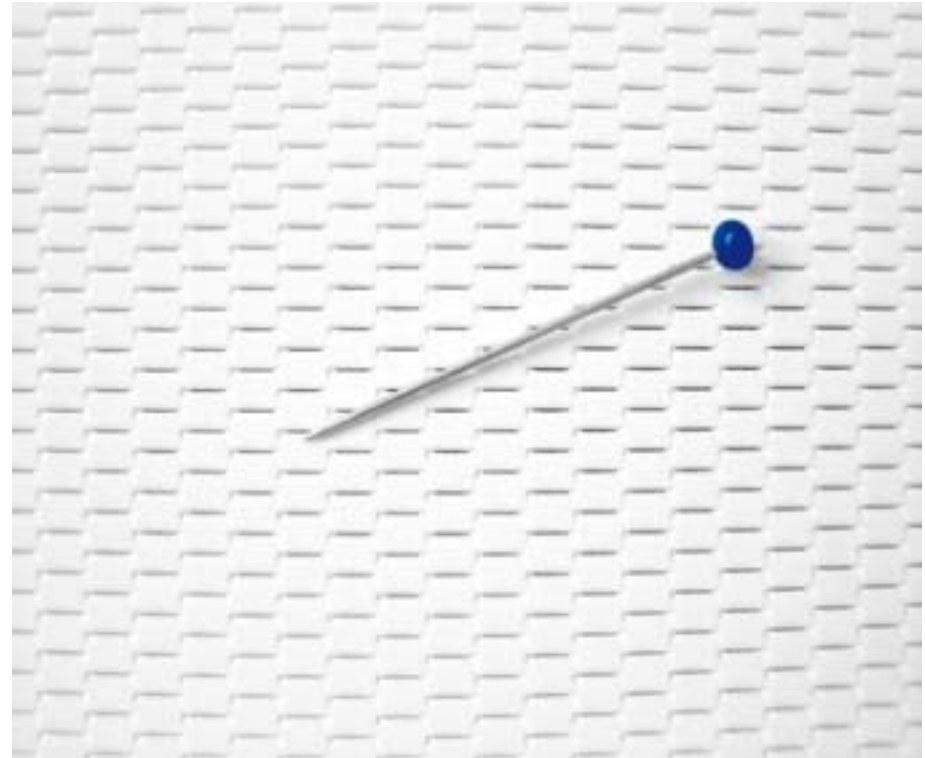


Alfa Acoustics
Silence through Science

Macro-perforated to Micro-perforated materials -



Macro-perforated Panel
Hole diameter 1.2 - 2.3 mm



Micro-perforated Panel
Hole diameter 0.2-0.5 mm



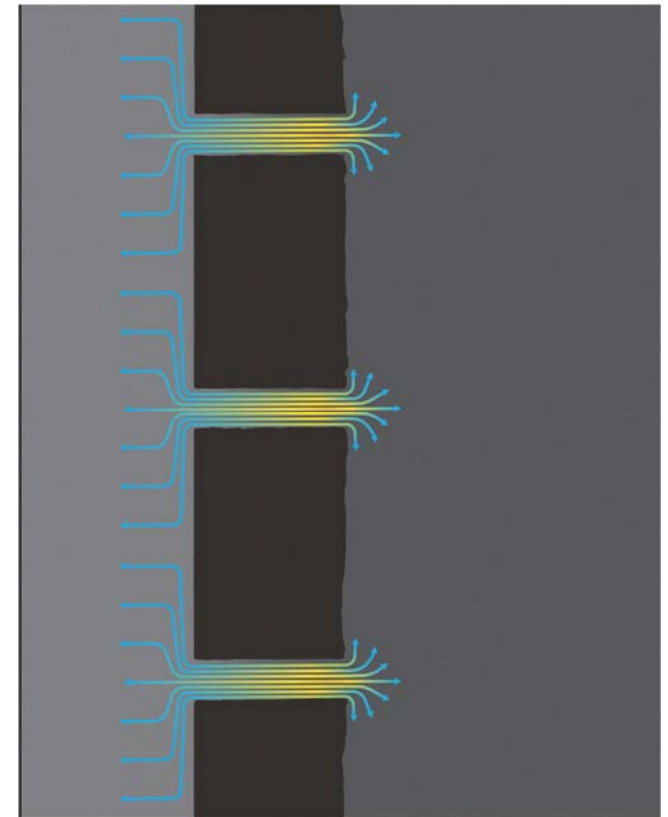
Modelling of Micro-perforated materials

- First time modelled by D Y Maa, China

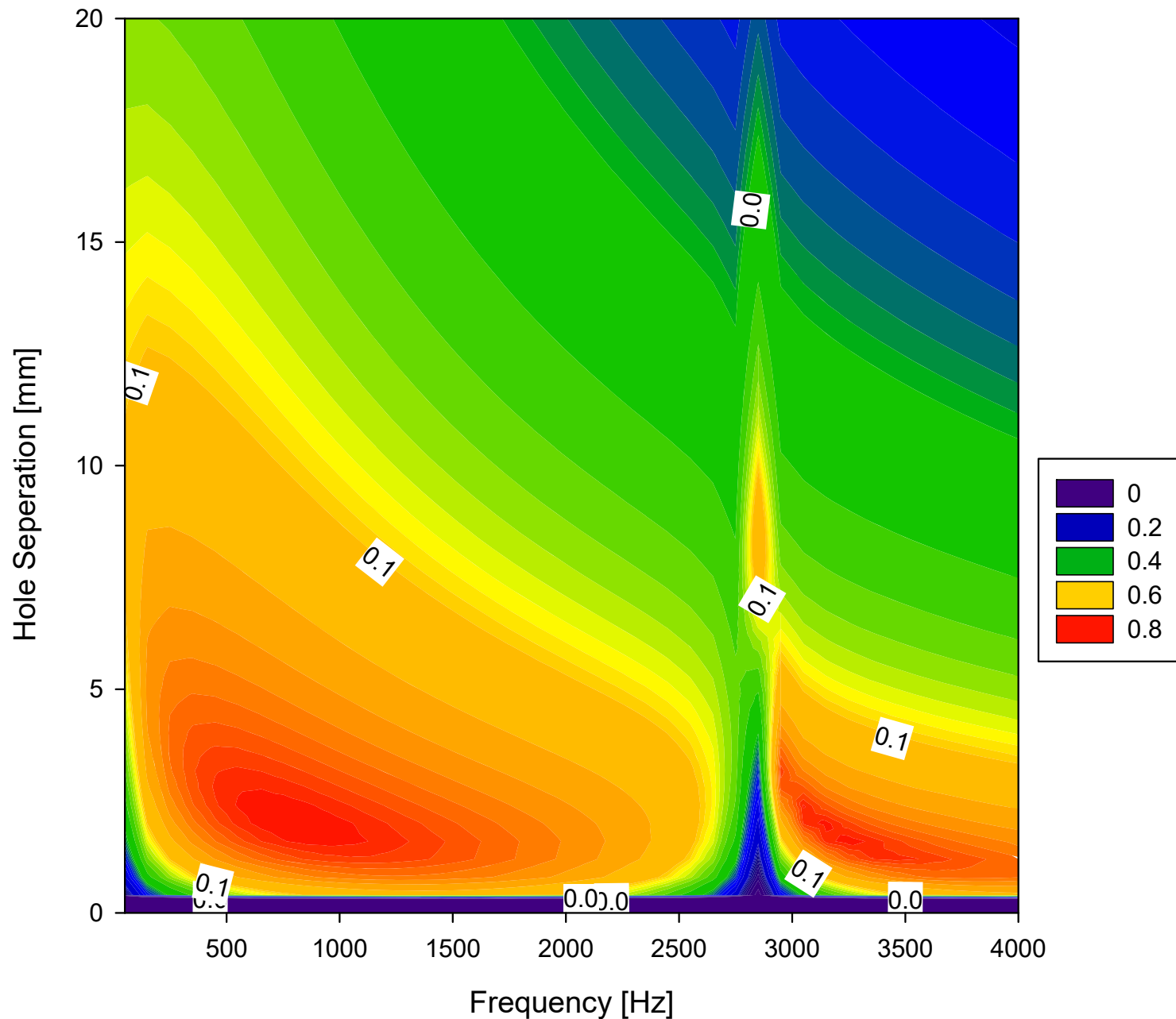
$$Z_1 = j\omega\rho_0 t \left[1 - \frac{2}{k\sqrt{-j}} \frac{J_1 k\sqrt{-j}}{J_0 k\sqrt{-j}} \right]^{-1}$$

$$k = a \sqrt{\frac{\rho_0 \omega}{\eta}}$$

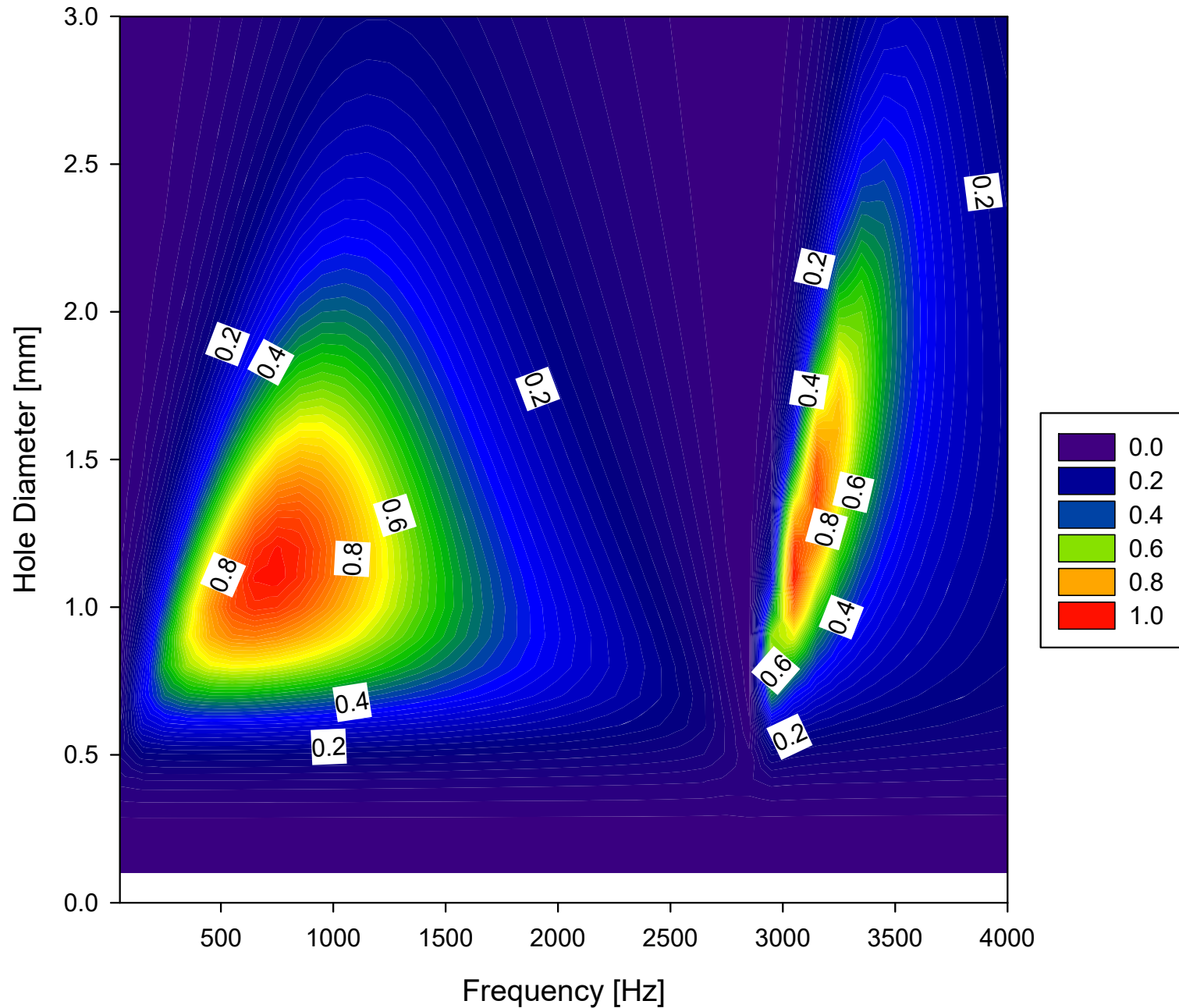
a is the radius of the holes
 ρ_0 density of air
 η viscosity of air
 J_1 Bessel function of the first kind and first order.



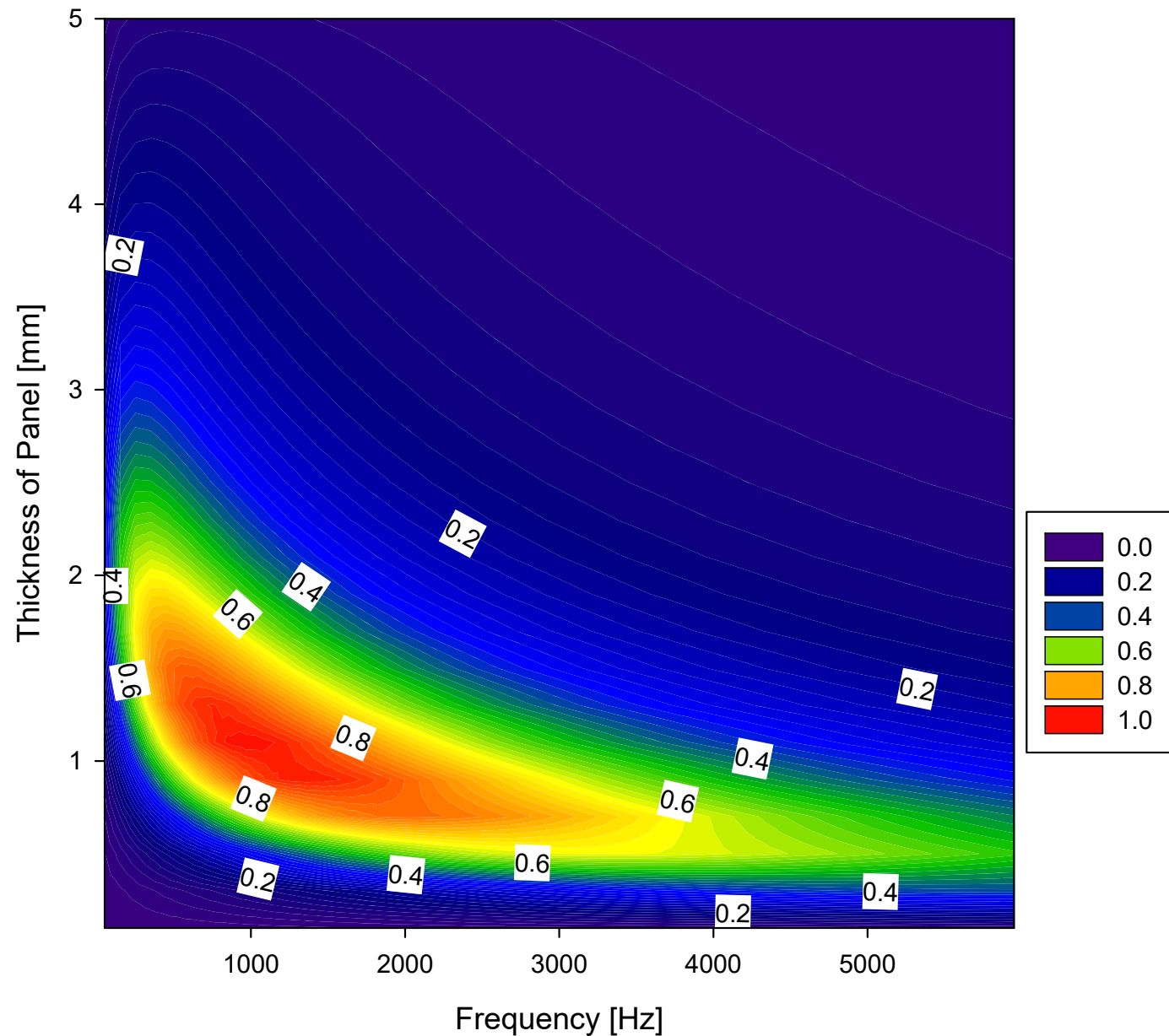
Effect of hole separation on Sound absorption coefficient



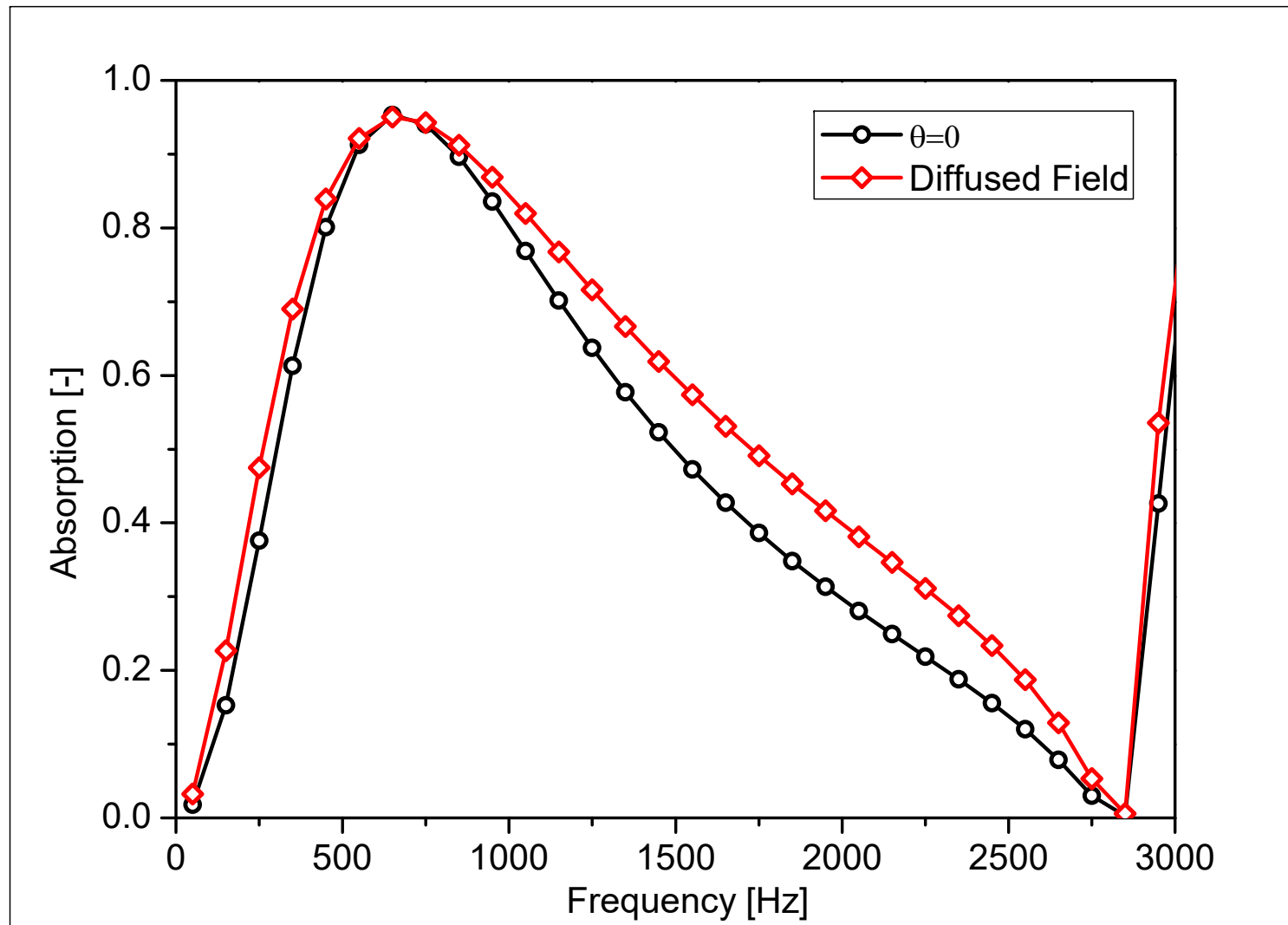
Effect of hole diameter on Sound absorption coefficient



Effect of panel thickness on Sound absorption coefficient



Sound Absorption Coefficient of Micro-perforated Panel



MPP for Bus Noise control -



MPP for Bus Noise Control –Contd.



MPP as Engine Hood -



MPP mounted on the hinged part of the engine hood.



MPP as Absorber and Head Shield -



Thank you!

