

Μέρος_3

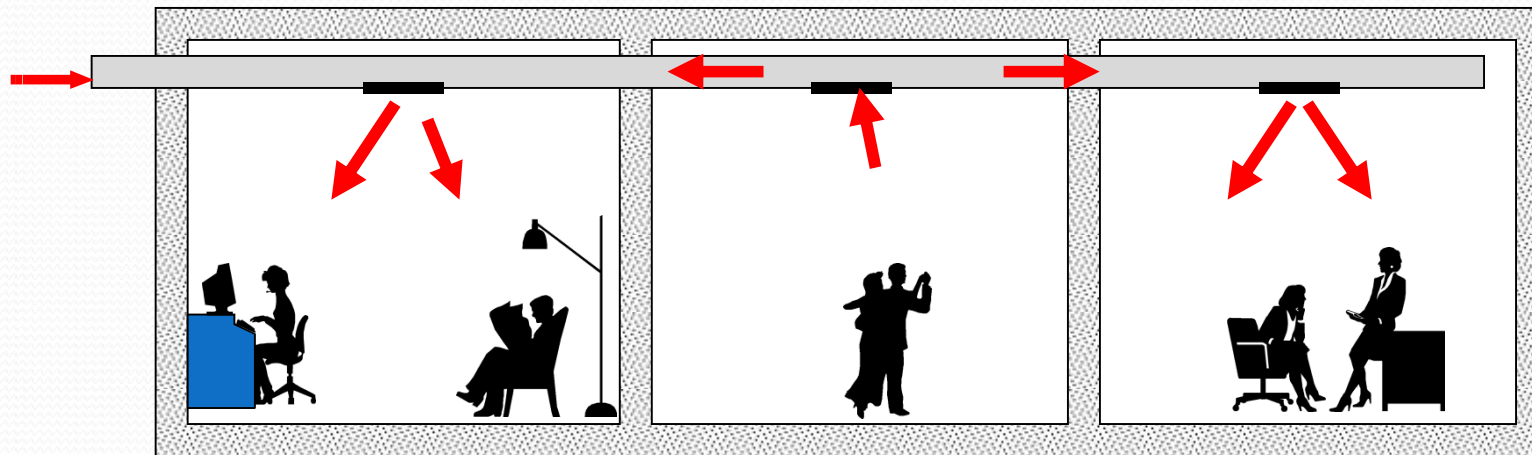
Σιγαστήρες

Δημήτρης Σκαρλάτος
Αν Καθηγητής Παν/μιου Πατρών
Τμ Μηχανολόγων & Αεροναυπηγών
Μηχανικών

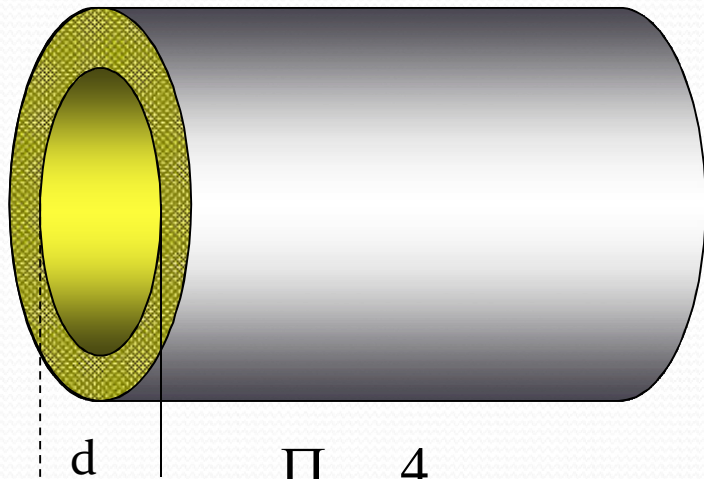
Κατηγορίες Σιγαστήρων

- Απορροφητικοί (absorptive)
- Αντίδρασης (reactive)
- Συντονιστές (resonators)
- Διάχυσης (Diffusion)

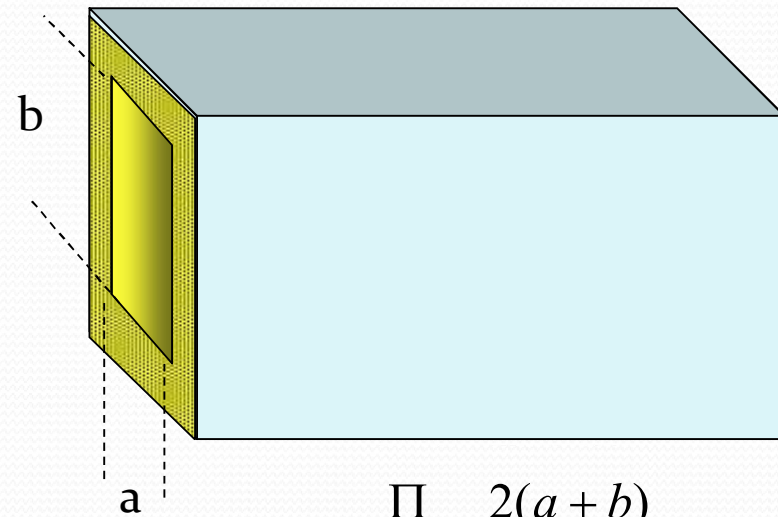
Μεταφορά θορύβου απο αεραγωγούς



Απορροφητικοί (πορώδεις απορροφητες)



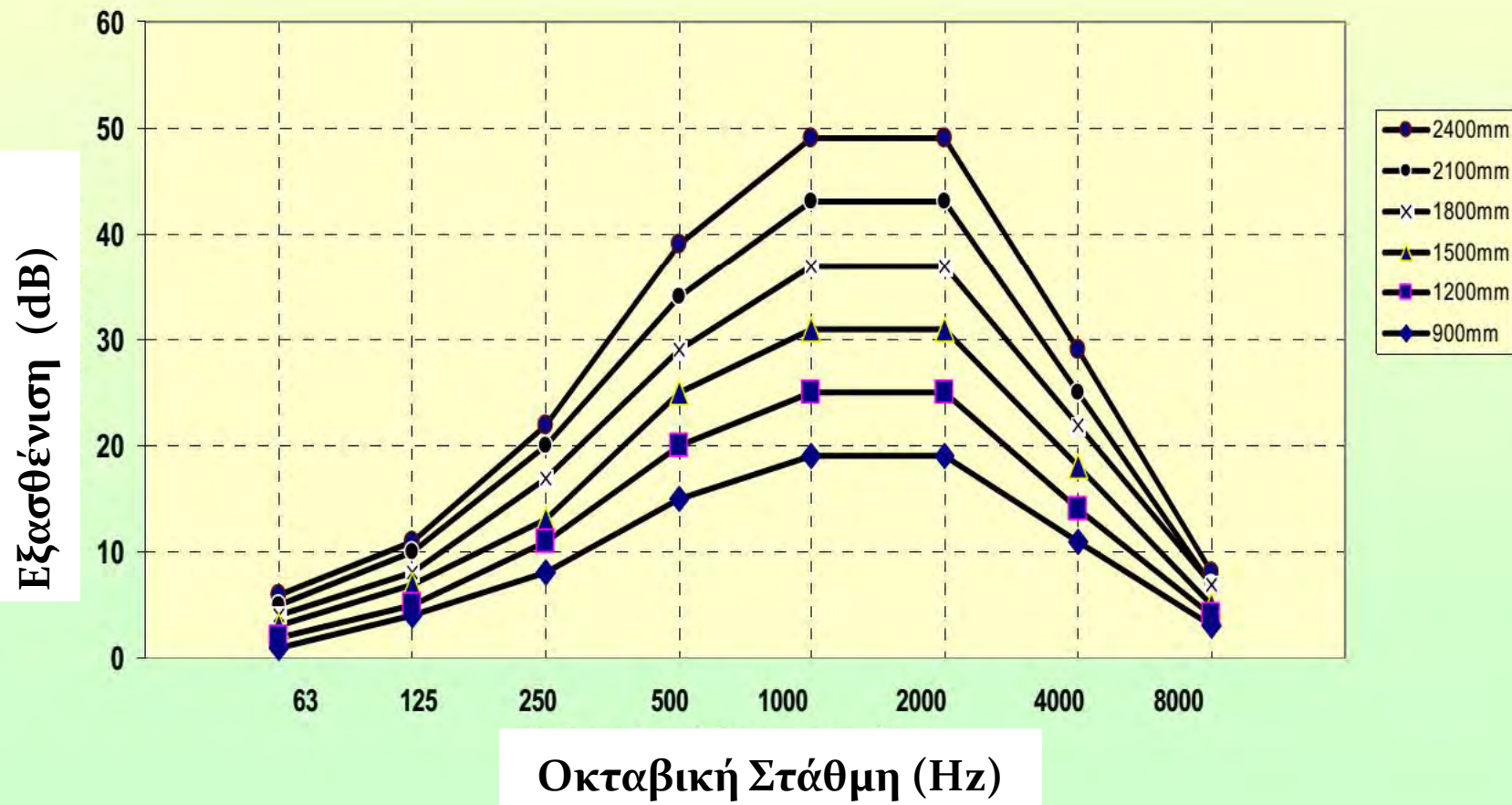
$$\frac{\Pi}{S} = \frac{4}{d}$$



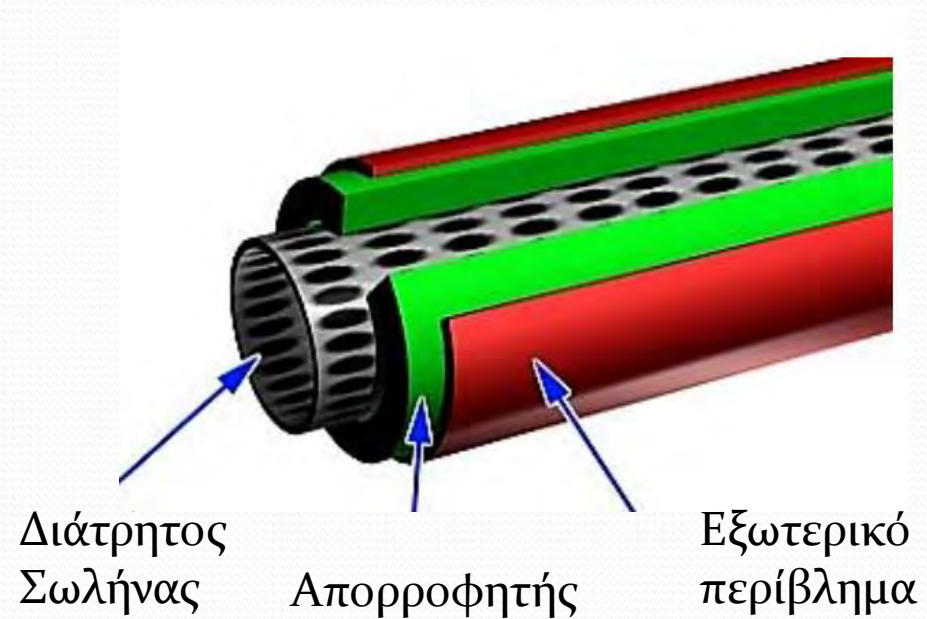
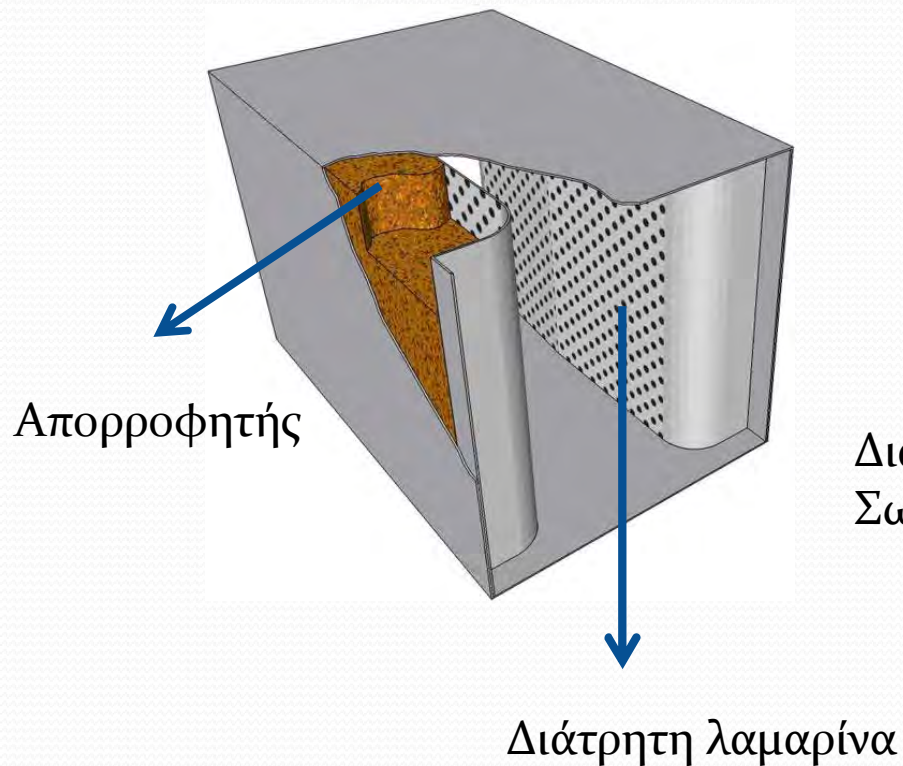
$$\frac{\Pi}{S} = \frac{2(a+b)}{ab}$$

$$\Delta L = a^{1.4} \frac{\Pi}{S} \quad dB / m$$

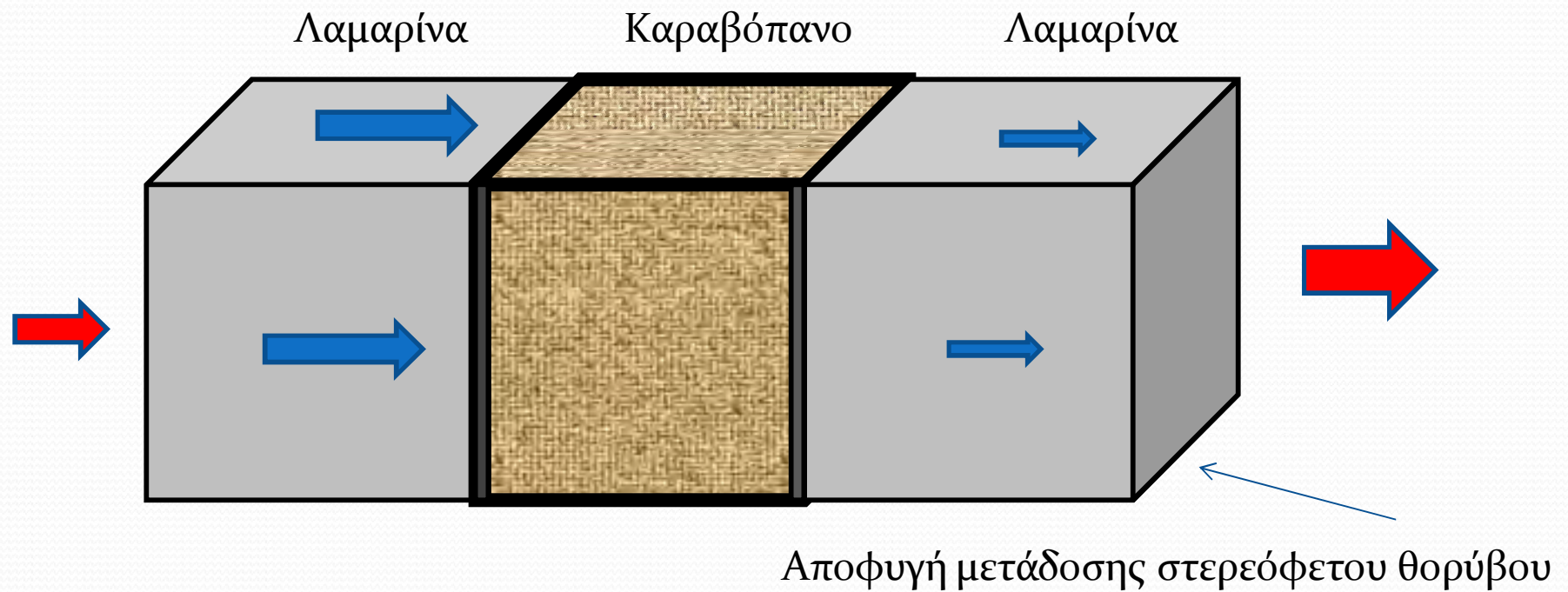
Εξασθένιση για διαφορά μήκη απορροφητή



Απορροφητικοί (διατρητοι απορροφητές)



Προφυλάξεις: (Μειωση στερεόφερτου θορύβου)

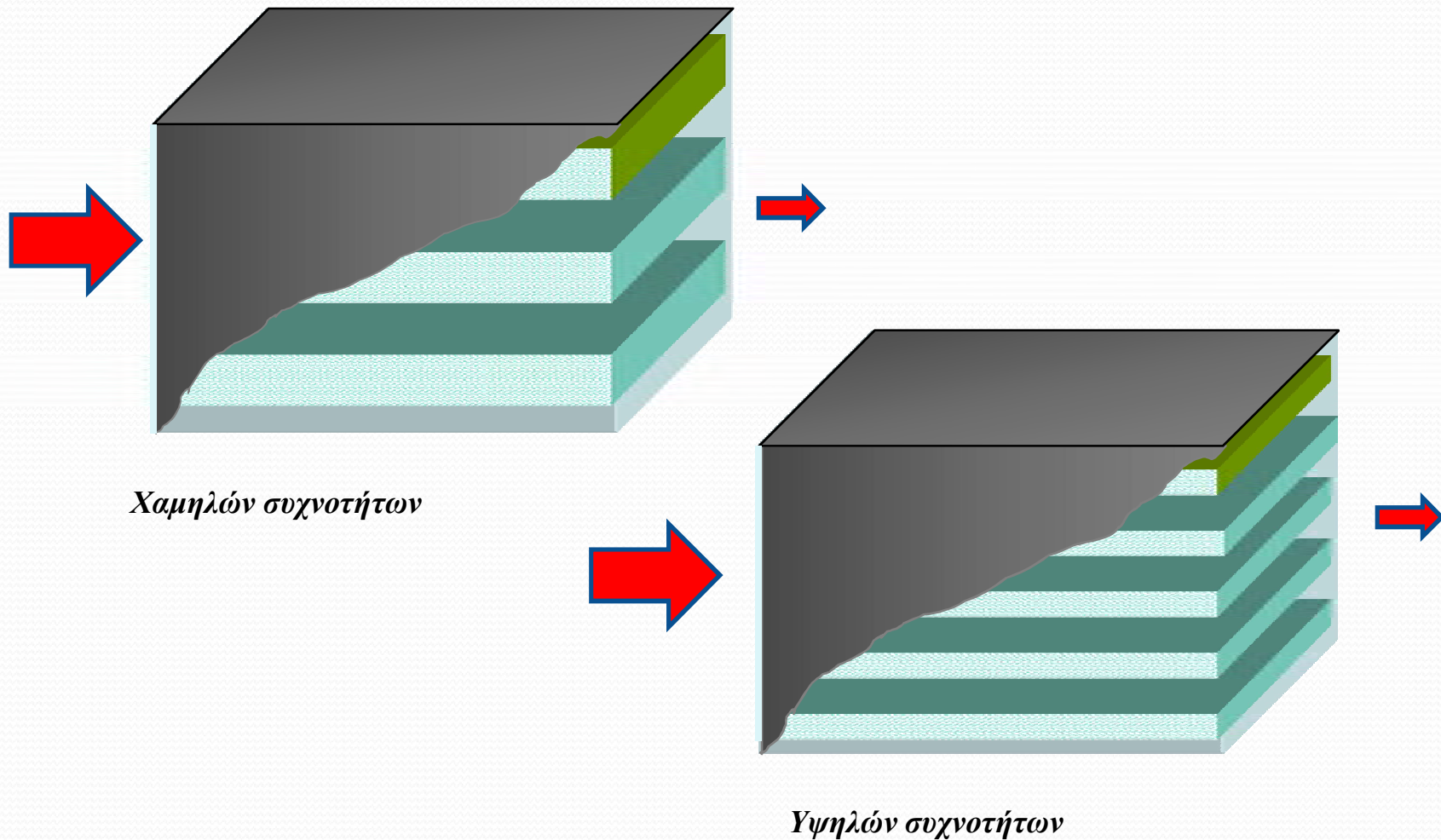


Προφυλάξεις (Μειωση δευτερογενούς εκπομπής)

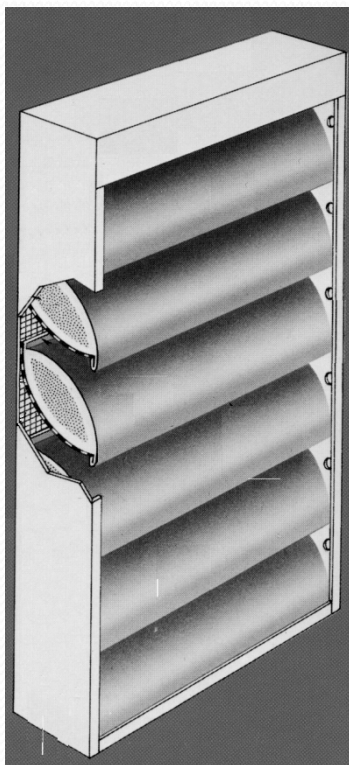


Αποφυγή εκπομπής με απόσβεση ταλαντώσεων

Παράλληλοι απορροφητές



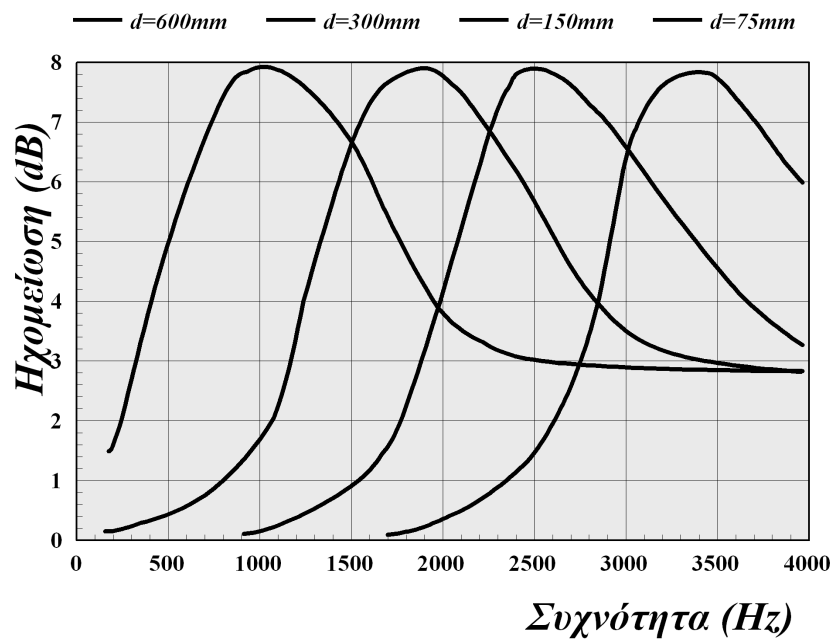
Περσίδες



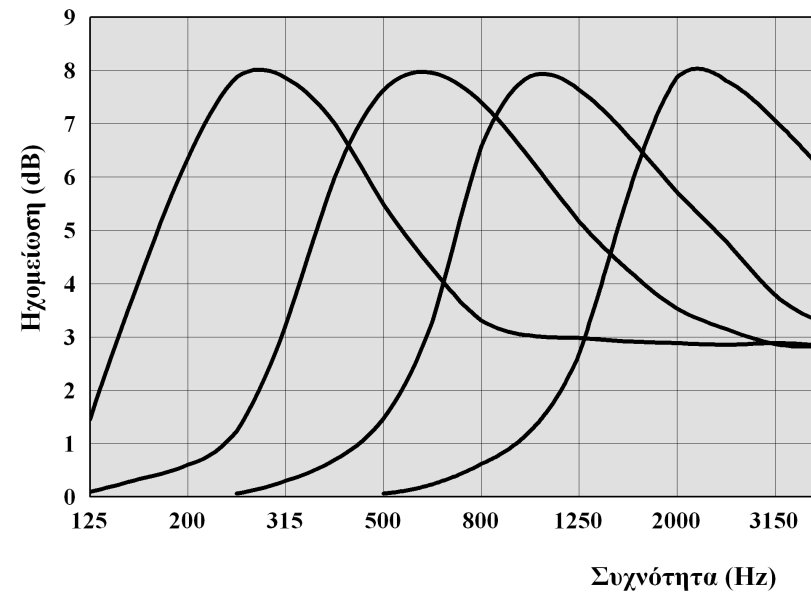
Γωνίες



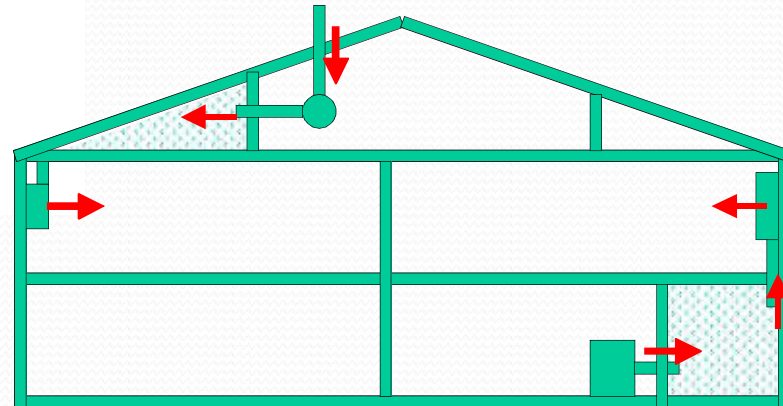
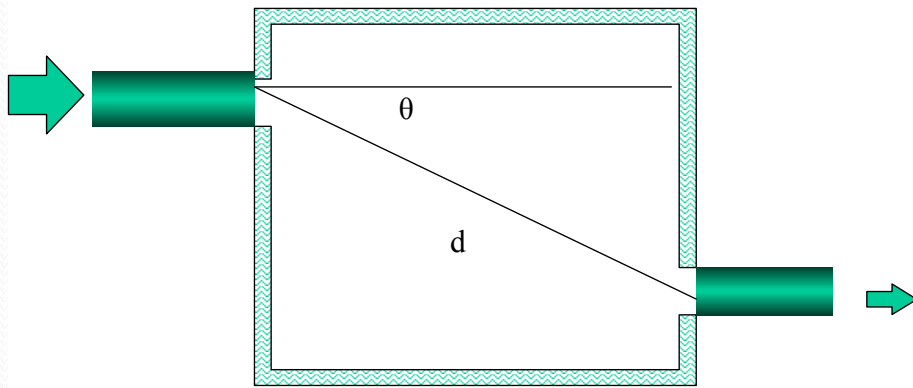
Ηχομείωση γωνιών χωρίς απορροφητικό υλικό



Ηχομείωση γωνιών με πάχος απορροφητικού $d/10$

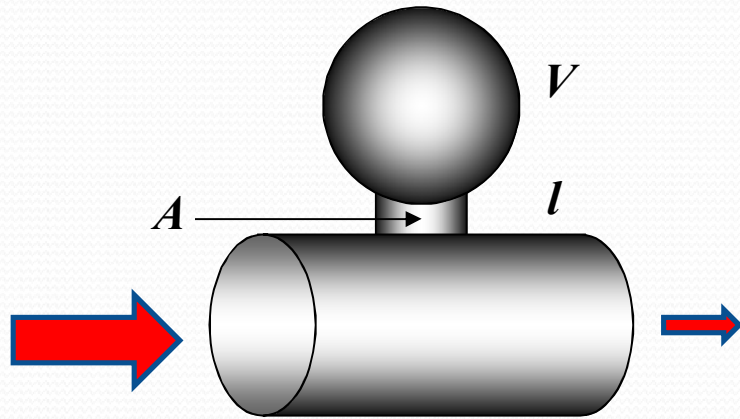


Επενδυμένος Θαλαμος



$$R = 10 \log \frac{1}{s \left[\frac{\cos \theta}{2\pi d^2} + \frac{1-a}{A} \right]}$$

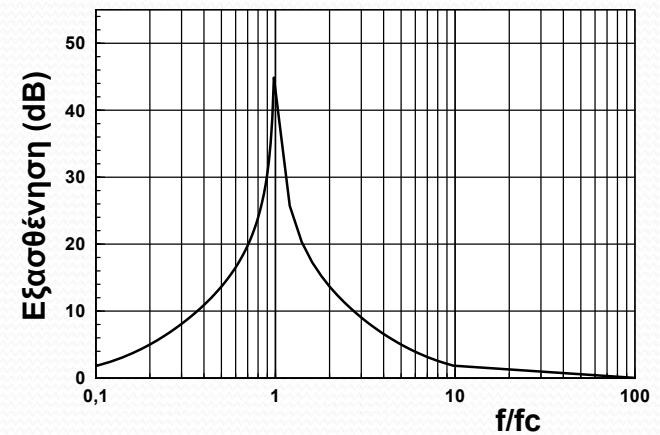
Σιγαστήρες συντονιστών



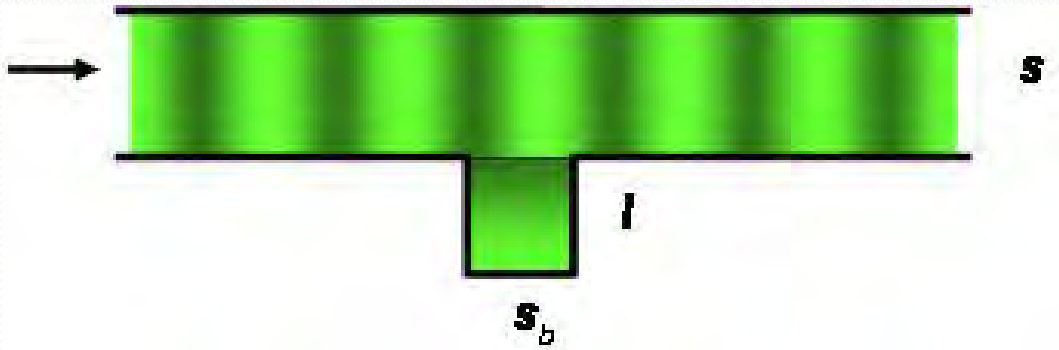
$$f_r = \frac{c}{2\pi} \sqrt{\frac{A}{lV}}$$

$$k_n = \sqrt{\frac{A}{lV}}$$

$$R = 10 \log \frac{\left(\frac{A}{2sk_n l} \right)^2 \left(\frac{f_r}{f} \right)^2 + \left(\frac{f_r^2}{f^2} - 1 \right)^2}{\left(\frac{f_r^2}{f^2} - 1 \right)^2}$$

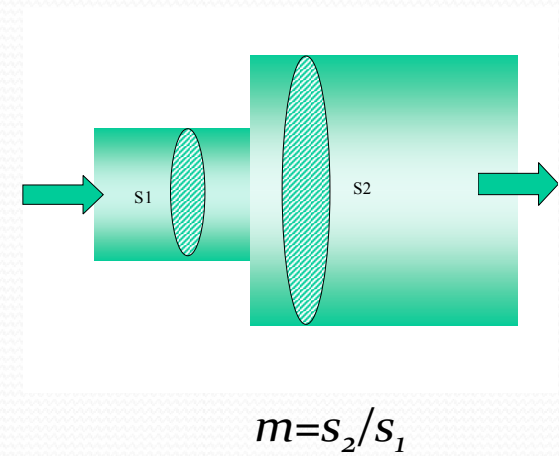
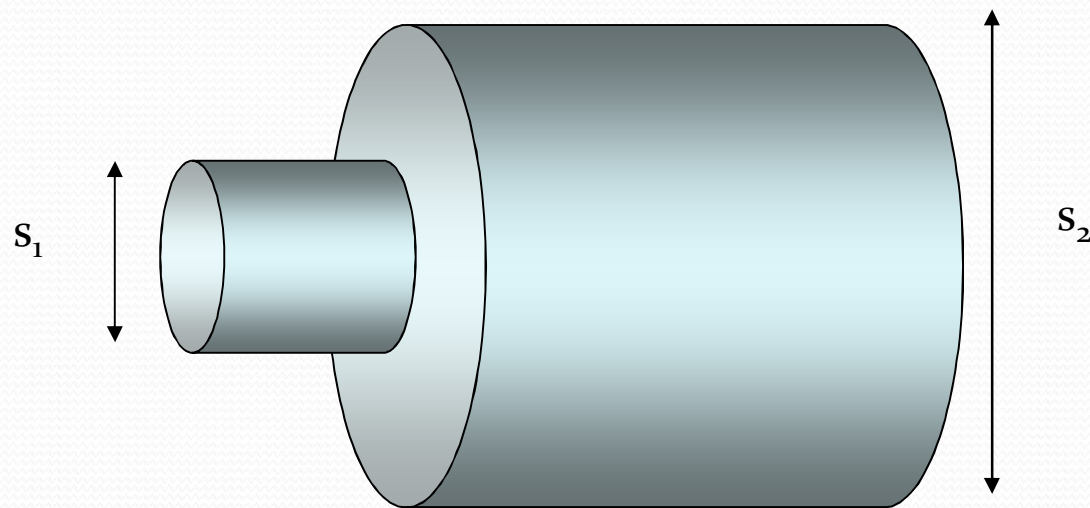


1/4 μήκους κύματος



$$R = 10 \log \left[1 + \left(\frac{s_b}{2s} \right)^2 \tan^2 \left(\frac{\pi f}{2f_r} \right) \right]$$

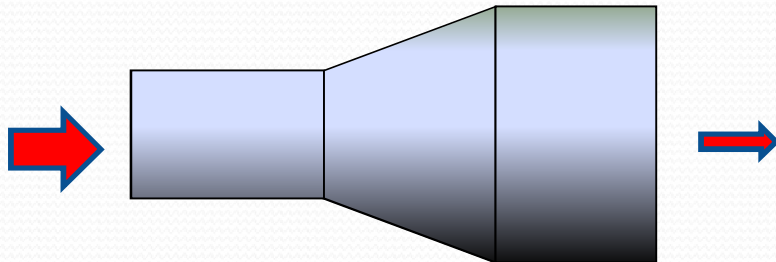
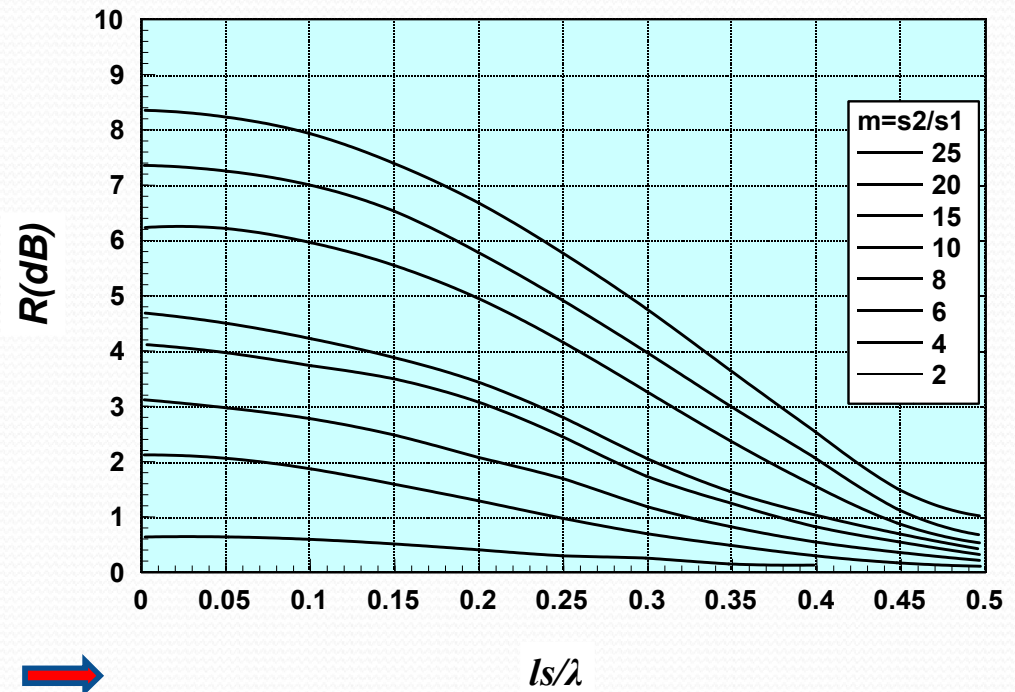
Αλλαγή διαμέτρου



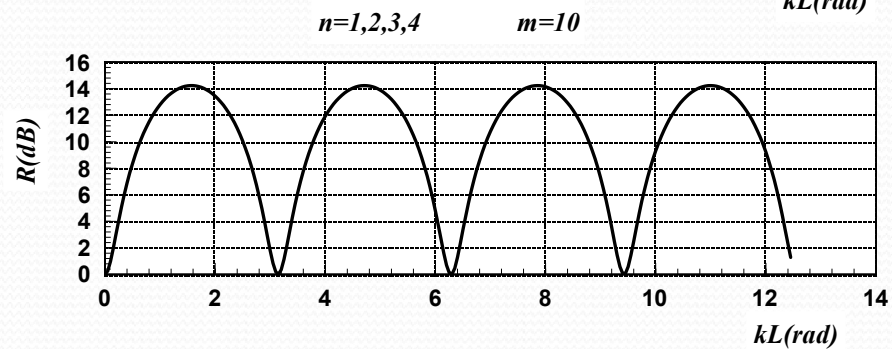
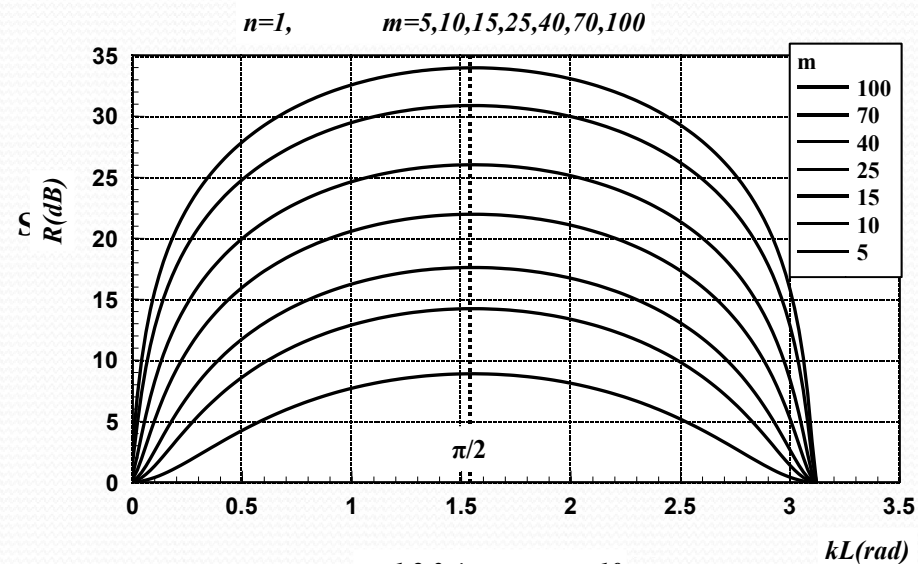
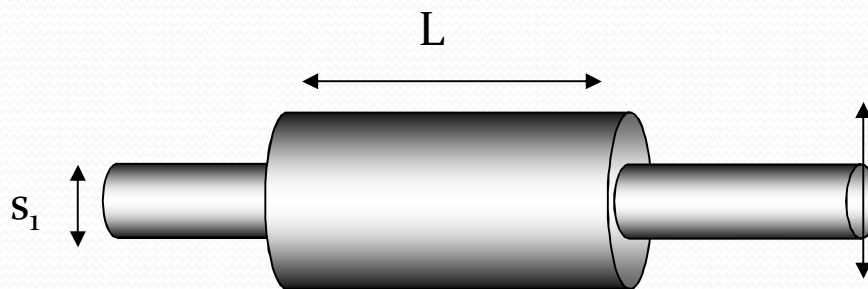
$$R(dB) = 10 \log \frac{1}{4} \left(m + \frac{1}{m} + 2 \right)$$

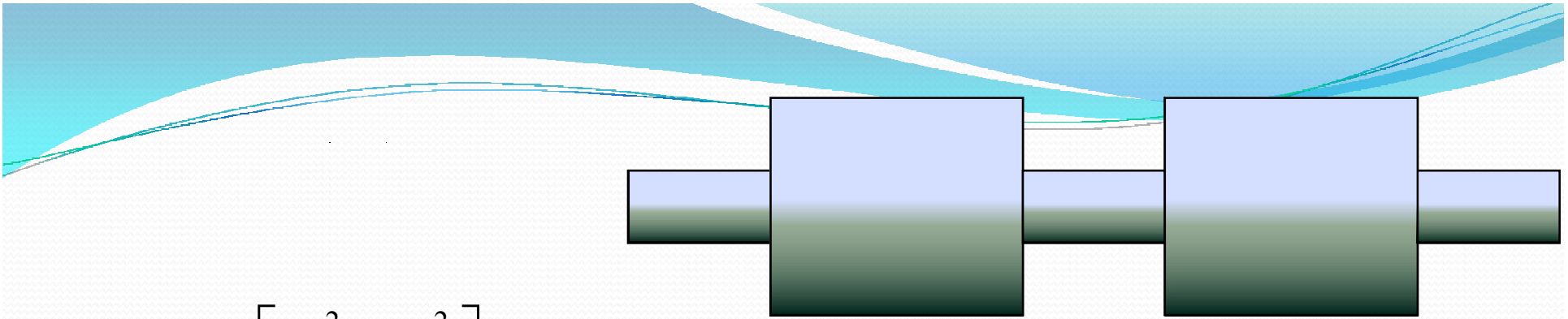
Κωνικός σύνδεσμος

Ηχομείωση κωνικού συνδέσμου

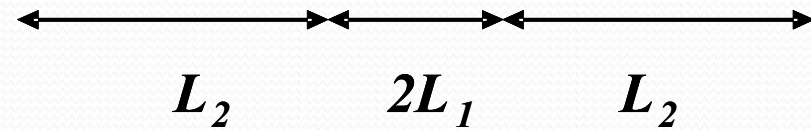


Απλός Θάλαμος Εκτόνωσης

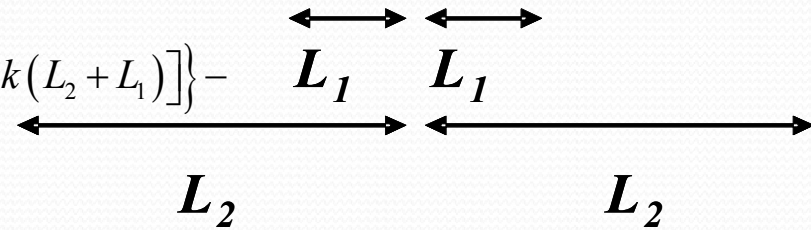
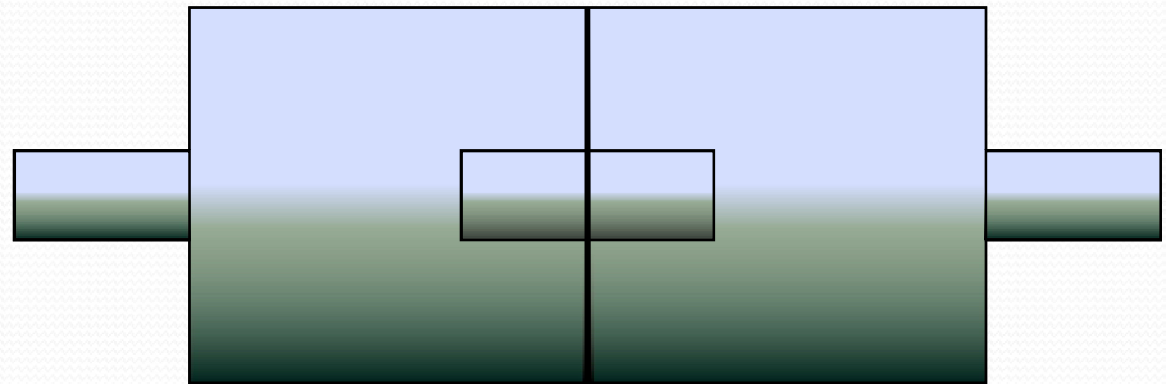




$$R = 10 \log \left[\frac{F_1^2 + F_2^2}{16m^2} \right]$$

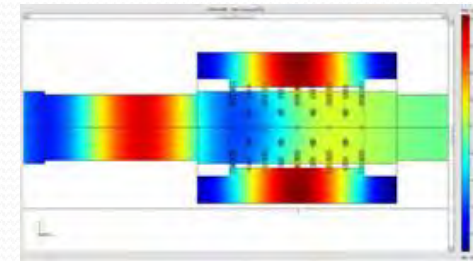
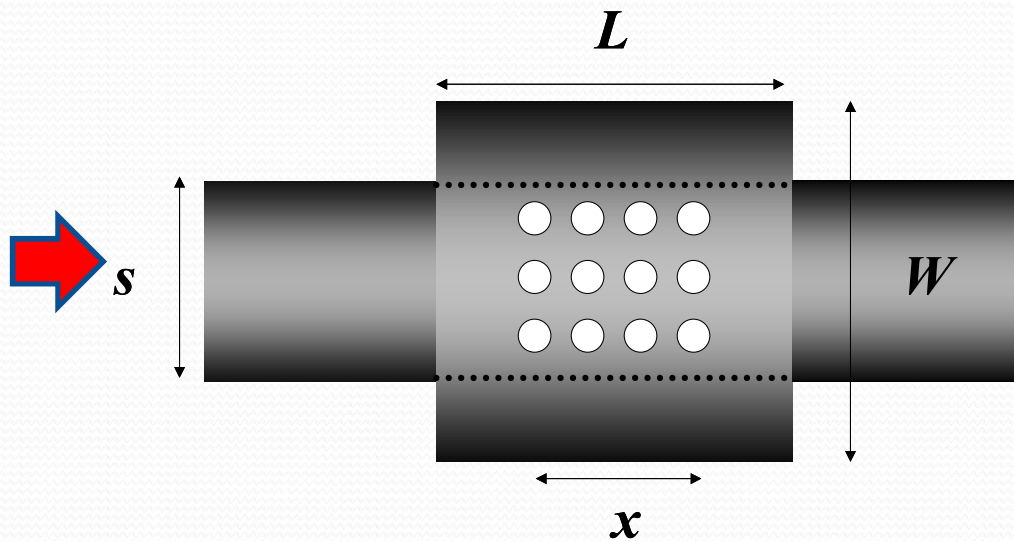


$$F_1 = (m+1)^2 \cos[2k(L_1 + L_2)] - (m-1)^2 \cos[2k(L_1 - L_2)]$$



$$F_2 = \frac{1}{2} \left(m + \frac{1}{m} \right) \left\{ (m+1)^2 \sin[2k(L_1 + L_2)] - (m-1)^2 \sin[2k(L_2 + L_1)] \right\} - \left(m - \frac{1}{m} \right) (m^2 - 1) \sin(2kL_1)$$

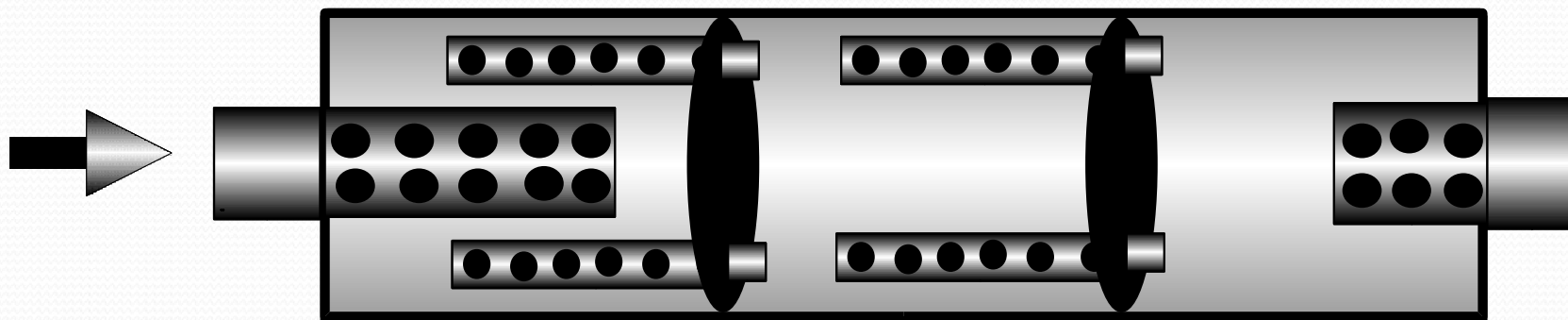
Διατρηση Αγωγού

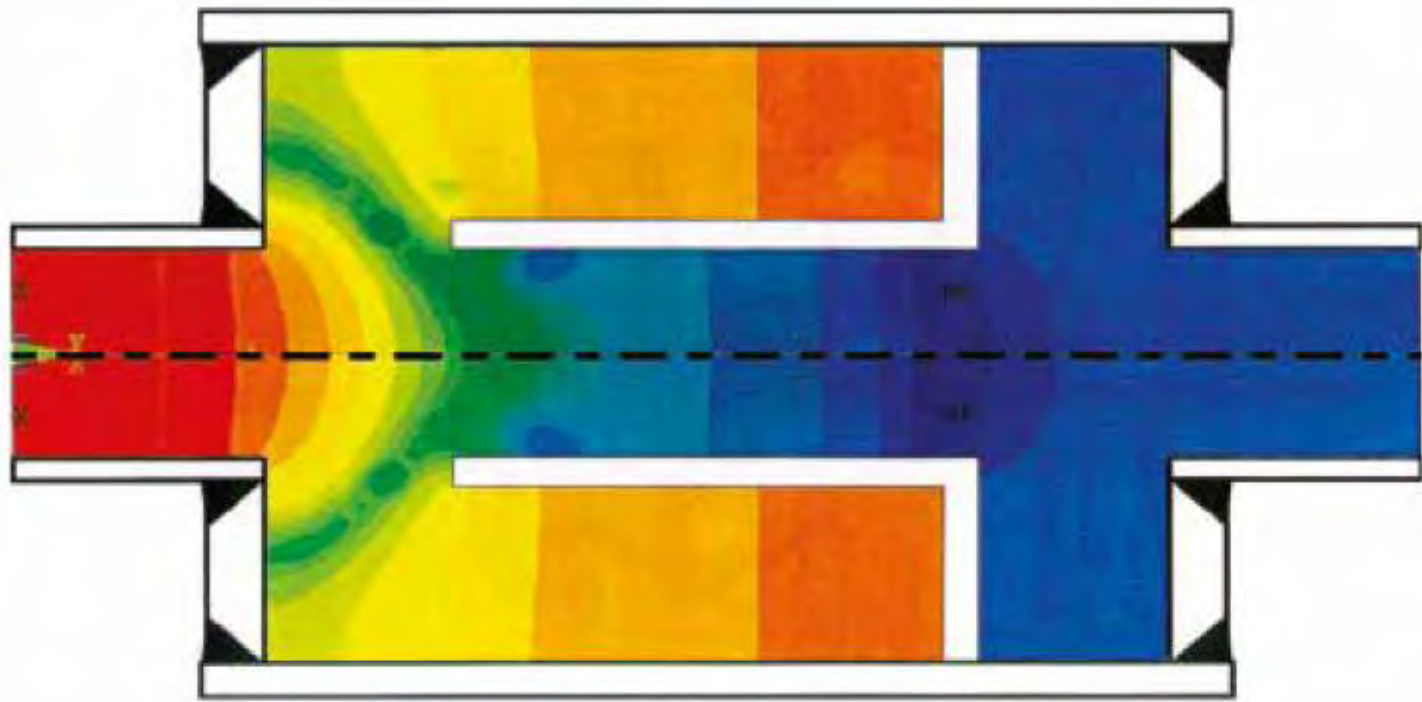
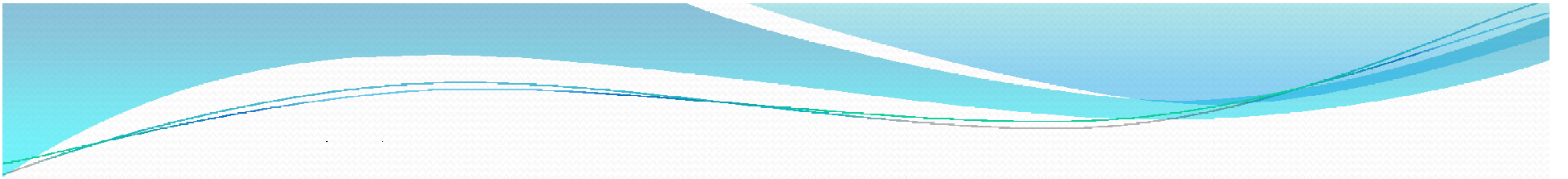


$$R_b = 10 \log \left[1 + \frac{NGV}{2S^2} \right]$$

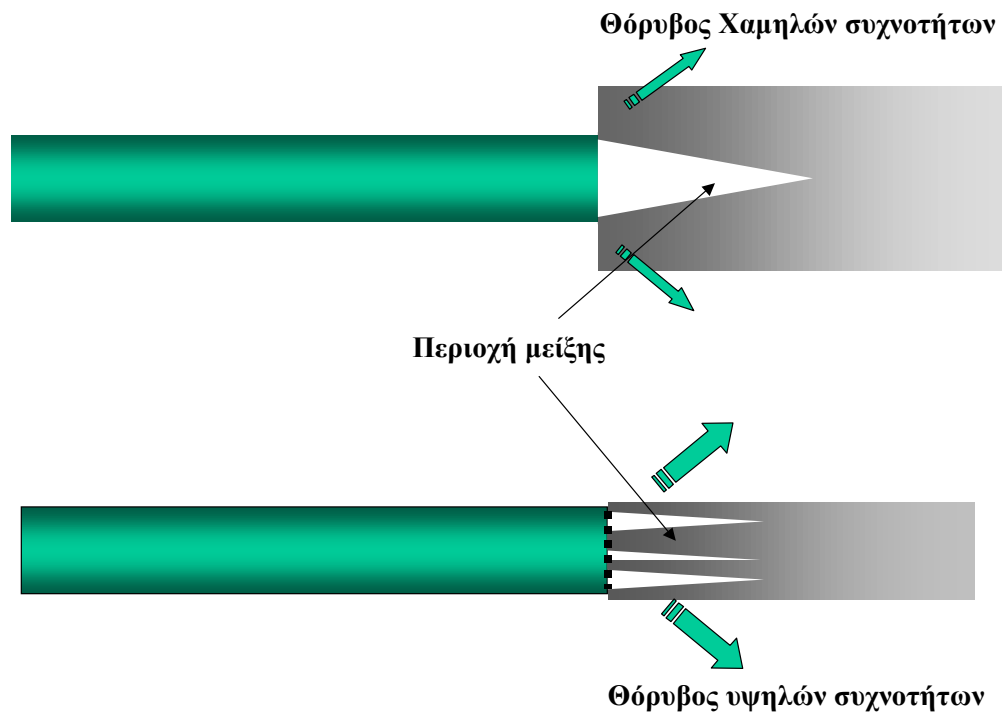
$$f_r = \frac{c}{2\pi} \sqrt{\frac{NG}{V}} \quad G = \frac{s}{D + 0.8d}$$

Πολλαπλος θαλαμος με διατρηση





Τύπου διαχυσης



ANC σε εξατμήσεις



Διάφοροι τύποι Σιγαστήρων

