CALCULATION OF FRICTION LOSSES

Colebrook formula is usually used in the calculation of the duct losses at ventilation plants. However, if the ducts are rough and of large size, then the use of the Colebrook formula may lead to unacceptable deviations. As the effect of roughness is too high in duct losses, roughness should be either known directly or the λ value should be determined by tests.

Charts may also be used in order to do the calculations practically.

For instance, if the pressure loss corresponding to a meter's length of a duct in case of straight duct is expressed as R, then

$\Delta PR = R \cdot L$

$R = (\lambda / d) \cdot [(w^2 \cdot \gamma) / (2g)]$

Pressure losses in elbows are higher than those in straight ducts. In the markets, axial radii of elbows are taken as 1,5 or 2 times of the pipe diameter.

R = 1,5 D veya R = 2 D

Approximate total pressure loss in a 90 degree elbow:

$(ð° / 90°) [ξ 90° (\gamma / 2g)] wm^2$

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