Diffuser and Outlet Evasé Performance

The performance of fans can be improved by considering the inlet and outlet conditions to ensure smooth and undisturbed airflow into and out of the fan. One of the most useful methods of attaining improved performance is by including an Evasé on the discharge of the fan. An Evasé is a flow diffuser that converts kinetic energy into pressure energy. If an Evasé is designed correctly the pressure loss at the fan outlet can be significantly reduced.

As a general rule the included angle of the Evasé should be no greater than 30° between opposing walls. In the figure below the angle for maximum effectiveness is shown to be 7°. This is the optimum angle where there is some stall but it cannot fully develop and so doesn't appreciably affect the regain characteristics.

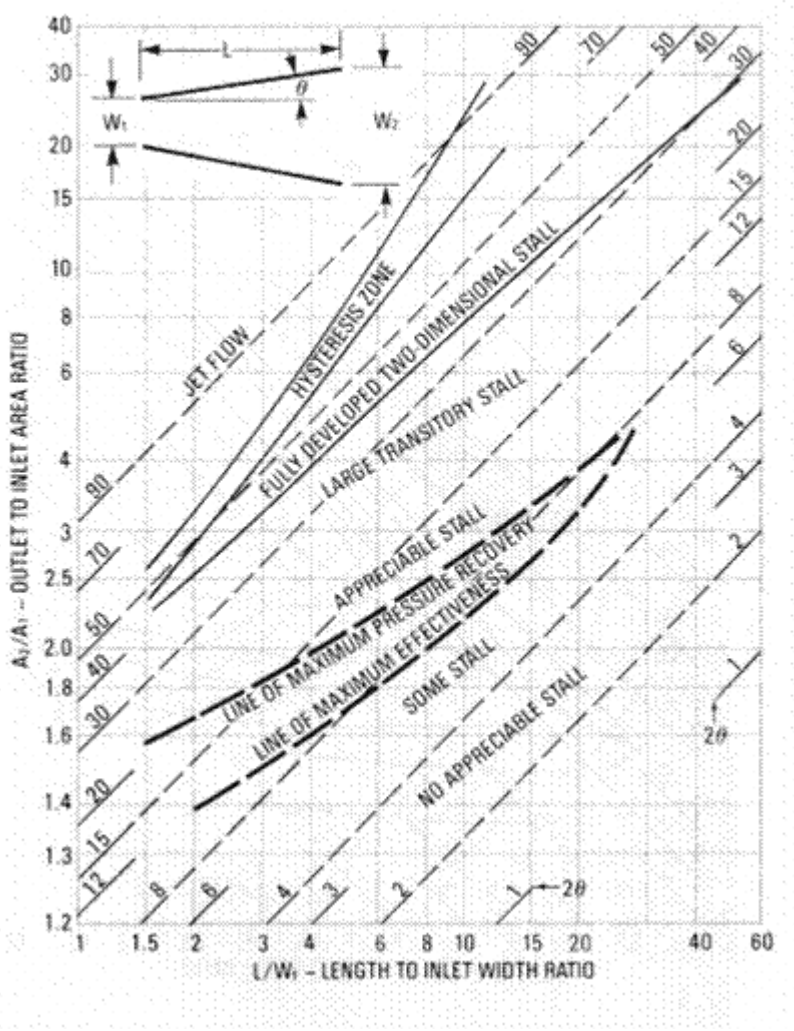

Figure 1
Flow Regimes in Plane Diffusers

From this figure it can be seen that the included angle of the Evasé is determined from the length and the inlet and outlet areas. If the outlet area required is large then the length should be increased where possible to achieve the 7° angle.