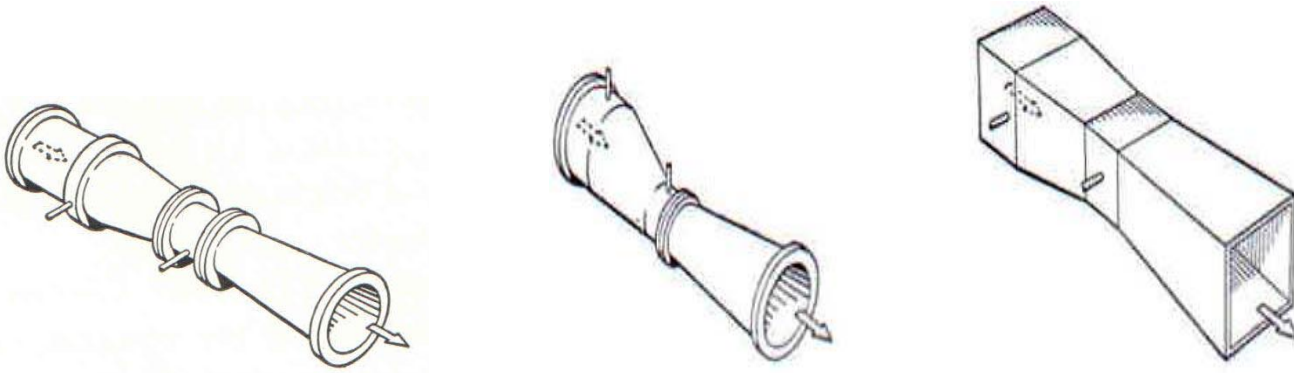


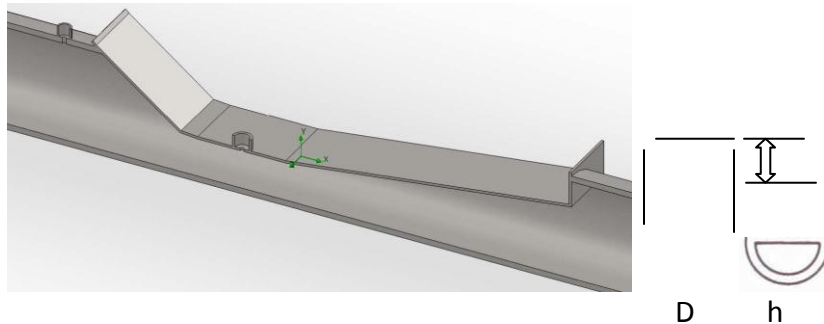
# AMITY's e-Wedge Venturi

R.W.Miller PhD, PE

A lower cost eccentric Segmental Wedge Venturi has being designed by AMITY to replace currently expensive standard ASME Venturies and eccentric Venturies used for sand-oil or dirty fluid applications. These meters are designed with improved cladding ability, similar overall pressure loss, and improved accuracy. Laboratory test results over a wide Reynolds number range confirms accuracy with low overall pressure loss



**Figure 1** Classical and Eccentric Venturies

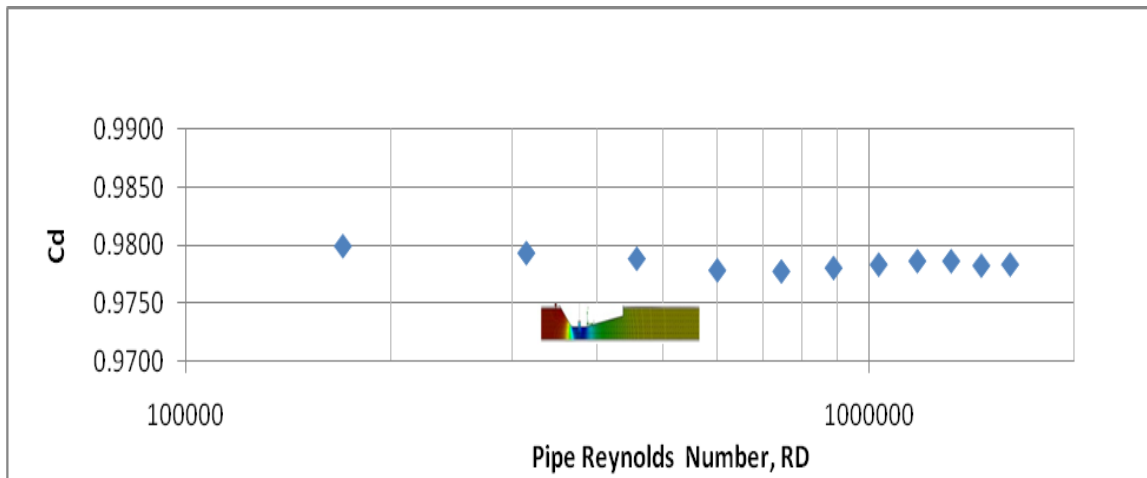


**Figure 2** e-Wedge Venturi a) Geometry b) Throat section

A Computational Fluid Dynamics (CFD) pressure plot for the meter tested at Alden hydraulic lab is shown in Figure 3.



**Figure 3** CFD's for Alden test 4" meter



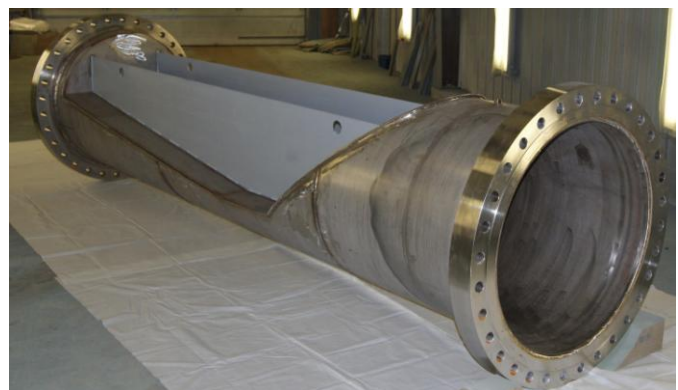
**Figure 4** Alden laboratories determined discharge coefficients

Shown in Figure 4 are the discharge coefficient data obtained at the Alden hydraulic laboratory. Discharge Coefficients over the calibration range are within  $\pm 0.08\%$ .

A 36 inch e-Wedge Venturi (Fig. 5 (b)) was recently calibrated at the Alden laboratory, resulting data was within the  $\pm 0.5\%$  accuracy for laboratory accuracy.



a) 42 inch Amity eccentric Venturi



b) 36 inch e-Wedge Venturi

**Figure 5** Amity's eccentric Venturies

The e-Wedge Venturi has the following advantages over the eccentric Venturi or ASME standard Venturies.

- Discharge coefficients constant over a wider Reynolds number range than eccentric or standard Venturies.
- Overall pressure loss same as an equivalent beta ratio ASME Venturi.
- Substantially lower cost by 1/3 over a standard ASME Venturi..
- Cladding and improved favorable pressure boundary layer control should extend meter life.
- Accuracy  $\pm 1.5\%$
- Overall length is considerably less resulting in lower weight.

The uncalibrated accuracy is expected to improve with additional data obtained with laser segmental area measurement equipment now being developed.