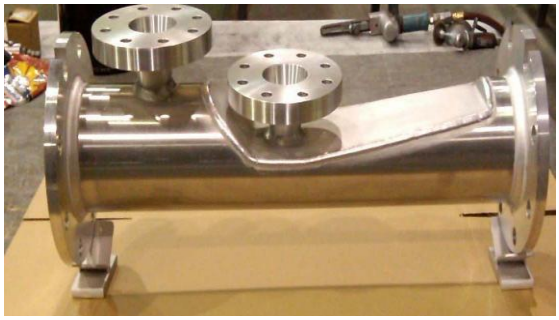
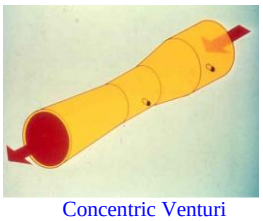


Experimental meter for density and tap design laboratory studies

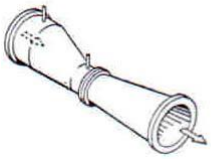
AMITY FLOW
e-Wedge Venturi

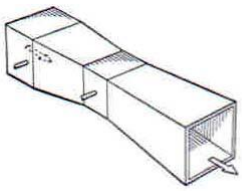
R.W.Miller Ph.D, P.E [1]

Metering difficult fluids such as slurries (sand-oil), corrosive, and erosive fluids has always been a major flowmeter challenge. For many years the Venturi was the meter of choice. Low overall pressure loss, minimum upstream piping resulting from streamlined fluid passage through these devices served the purpose well. The eccentric Venturi was used for more difficult fluids. The Segmental Wedge meter is now widely used in these applications.



Concentric Venturi

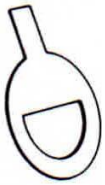




Eccentric Venturies

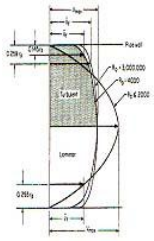
Venturi meters are costly and used only when absolutely necessary. If wear was not a problem the orifice remained the meter of choice. A small drain or vent hole is drilled in a standard orifice to vent gas or drain liquid. The eccentric or more costly segmental orifice is used for more difficult fluids.

Eccentric Orifice

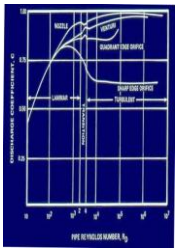


Segmental Orifice

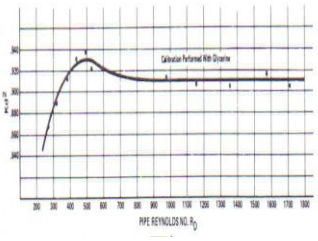
Laboratory tests conducted by the author on oil and water indicated that the eccentric meters discharge coefficient (Cd) was constant over a wider Reynolds number range than concentric meters. Segmental Wedge meter data confirms the coefficient constancy for a segmental flow aperture.



Newtonian velocity profiles

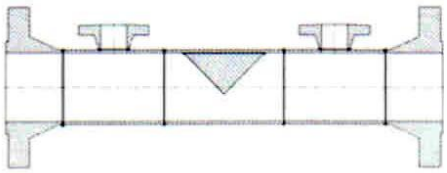


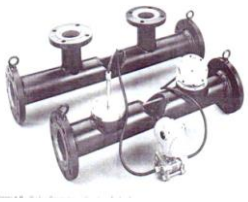
Profile effect on Cd



Segmental Wedge Meter

Segmental Wedge meters were introduced in the 1980's for difficult fluids. These meters proved highly successful with the added advantage of a constant discharge coefficient. The disadvantage of high overall pressure loss and required upstream piping lengths remains a significant concern.

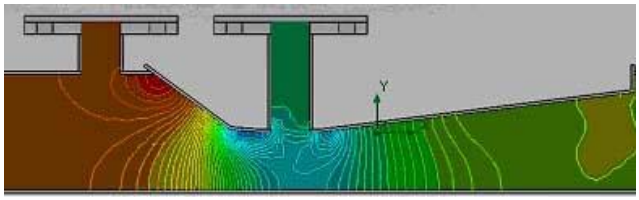




Segmental Wedge Meter

Employing Computational Fluid Dynamics (CFD) the author is developing, for AMITY FLOW, a low overall pressure loss ***Eccentric Segmental Wedge Venturi.*** Initial CFD slurry fluid studies indicate that a constant discharge coefficient, low overall pressure loss and minimum upstream lengths can be achieved. Laboratory test work is currently scheduled to complete the studies.

Experimental meter for density and tap design laboratory studies



CFD slurry fluid study for AMITY FLOW meters

[1]***R.W.Miller***, author *The Flow Measurement Engineering Handbook* RWMillerAssociates.com