PEM ANGULAR SPRAY DESIGN SUGGESTIONS

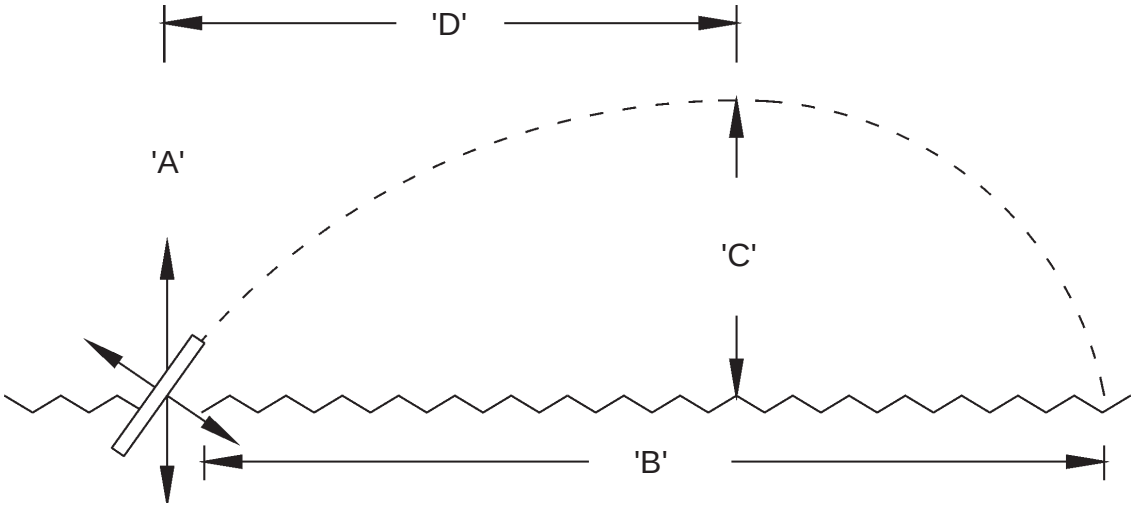
All spray design calculations are based upon linear, non -turbulent and/or non twisting inflow of water into the spray jet having minimum directional adjustment. Where turbulence and/or twisting flow is present and better performance is desired, the use of flow straightening devices in the pipe riser to the jet can show dramatic sprayheight (distance) improvements. Up to 2" pipe size, plastic flow straighteners, PEM 01050 Series, are installed into the base of a jet or in the riser pipe to the jet. Pipe sizes 2 1/2" and larger require PEM flow straightening devices, such as PEM 21000 Series dual action flow straighteners for critical major spray effects or PEM 23000 Series flow straightening flanges for regular spray effects with a lesser inflow turbulence. Follow the installation suggestions of the PEM flow straightening devices. If not certain about a particular design request assistance from factory

DESIGN FACTORS

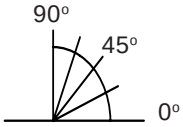
In General:

Multiplication Factors are used to find angular spray performances when sprayheight is known.

Dividing Factors are used to find the sprayheight when angular peformances are known



'A' Angle of nozzle elevation



'B' Horizontal distance of throw from nozzle.

'C' Height of trajectory in percentage of ' B '.

'D' Highest point of trajectory in horizontal distance from nozzle, measured in percentage of ' B '

'E' Multiplying or dividing factor for spray design calculations

'V' Vertical sprayheight (1967-'X')

'A'	'E'	'C'	'D'
5°	0.90	6%	36%
15°	1.33	11%	46%
25°	1.83	17%	49%
35°	1.94	22%	51%
45°	2.10	27%	52%
55°	1.80	36%	53%
65°	1.50	50%	56%
75°	0.90	99%	59%
85°	0.40	245%	64%

	TO FIND:	HOW:
1.	Horizontal distance of throw for a desired angle of spray, when only the vertical sprayheight is known.	Establish vertical sprayheight (factor 'V') and multiply the same by factor 'E' to achieve horizontal spray distance. ('X') x ('E') : Horizontal Distance
2.	Performance requirement of a spray pattern with known angle of nozzle discharge or the equivalent vertical sprayheight performance requirements	Establish horizontal distance of throw from nozzle and divide by factor 'E' on same line as shown discharge angle of nozzle . This will give vertical sprayheight which is then used to find performance requirements. (A) - ('B') : ('E') : Vertical Sprayheight
3.	Trajectory of a spray of water	Establish horizontal distance of throw (factor 'B') then calculate factors 'D' and 'C' thereof and combine the results with 'B' to lay out the trajectory.
4.	The jet elevation angle (factor 'A')for the specifi cation of particular trajectories or spray effects.	Establish horizontal distance of throw (factor 'B'),calculate highest point of trajectory (factor 'C') thereof and read on the factors table the angle of elevation (factor'A') on the same line as the result of the calculated height of trajectory (factor 'C')
5.	The manometric nozzle pressure for a sprayheight	Multiply vertical sprayheight (factor 'V') x 1.22 + 10% .

Data given on this page are stricly infomative only, to be used in the layout of normal size water displays, for special applications provide full scale prototype testing as to be installed before providing artistic impressions of the project.

SPRAYS 2006-1 replaces 2005-1