



**ESRD Update:  
Transitioning to New ESRD Conditions for Coverage  
Student Manual**

# Lesson #16: Surveyor Tools



# FLOW VELOCITY CALCULATOR

Enter your pipe size in Inches (yellow-1st box), and your loop flow rate (blue-2nd box) in Gallons per Minute

Pipe Size Inches	Flow Rate in GPM	Pipe Area in SF	Flow Rate in CF/Sec	Flow Velocity feet / sec	Meets Standard?
0.75	5	0.00307	0.01114	3.625	Yes

(Based on an Indirect Feed system)

The Formula is  $V = Q/A$

Where:  $V$  = flow velocity in feet/sec  
 $Q$  = flow rate in feet<sup>3</sup>/sec  
 $A$  = cross sectional area of distribution pipe in feet<sup>2</sup>

The AAMI Recommended Flow Velocity is 3.0 feet per second for indirect feed systems, 1.5 feet per second for direct feed system.

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# EBCT CALCULATOR

To calculate the needed amount of carbon to achieve the required EBCT, enter the flow rate in the yellow cell (labeled GPM) below

Enter your flow rate in GPM	Required EBCT in minutes	Below is the required volume of carbon in Cubic Feet	
12.00	5	8.02	For each worker and polisher tank
12.00	10	16.04	Total amount of carbon needed

The Formula is  $V = (Q \cdot EBCT) / 7.48$  where V = volume of carbon and Q = flow rate in gallons per minute

To calculate the actual EBCT, enter the flow in the yellow cell (labeled GPM) and the volume of carbon in the blue cell (labeled volume of carbon per tank)

Enter your flow rate in GPM	Enter your volume of carbon, per tank	Below is your actual Empty Bed Contact Time per tank.	Meets AAMI EBCT Standard?
5.00	3.60	5.39	Yes

The Formula is  $EBCT = (V/Q) \cdot 7.48$  where V = volume of carbon and Q = flow rate in gallons per minute

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