

## MINIMUM GRANULAR ACTIVATED CARBON (GAC) VOLUMES NEEDED FOR EBCT

The reference chart below lists minimum GAC volumes (ft.<sup>3</sup>) required to meet the specific EBCT (Empty Bed Contact Time) conditions for the portable ROs when the equipment is operating with the specific dialysis flow rating.

### Minimum GAC Volume Required To Meet: 10 Min EBCT

<u>RO System Model</u>	<u>500 ml/min dialysis flow</u>	<u>800 ml/min dialysis flow</u>
Series 700 (ALL)	1.4 ft <sup>3</sup>	1.5 ft <sup>3</sup>
Millenium 750	1.4 ft <sup>3</sup>	1.5 ft <sup>3</sup>
Millenium HX 1.5 ft <sup>3</sup>	1.5 ft <sup>3</sup>	
WRO 300*	1.1 ft <sup>3</sup>	1.1 ft <sup>3</sup>
WRO 300 H*	1.1 ft <sup>3</sup>	1.1 ft <sup>3</sup>
EON	1.5 ft <sup>3</sup>	1.5 ft <sup>3</sup>

The reference chart below lists minimum GAC volumes (ft.<sup>3</sup>) required to meet the specific EBCT conditions for the ROs when the equipment is in normal operating and recovery mode and at the maximum product flow rating.

<u>RO System Model</u>	<u>Recovery %**</u>	<u>10 Min EBCT</u>	<u>Recovery %**</u>	<u>10 Min EBCT</u>
23G 3000	50	5.6 ft <sup>3</sup>	-	-
23G 4500	50	8.4 ft <sup>3</sup>	-	-
23G 6000	50	11.2 ft <sup>3</sup>	75	7.5 ft <sup>3</sup>
23G 7500	50	14.0 ft <sup>3</sup>	75	9.3 ft <sup>3</sup>
23G 9000	50	16.8 ft <sup>3</sup>	75	11.2 ft <sup>3</sup>
23G 10500	50	20.0 ft <sup>3</sup>	75	13.0 ft <sup>3</sup>
23G 12000	50	22.3 ft <sup>3</sup>	75	14.9 ft <sup>3</sup>
23G 13500	50	25.1 ft <sup>3</sup>	75	16.8 ft <sup>3</sup>
23G 15000	50	27.8 ft <sup>3</sup>	75	18.6 ft <sup>3</sup>
23G 16500	50	30.5 ft <sup>3</sup>	75	20.4 ft <sup>3</sup>
4400M/4000	50	7.5 ft <sup>3</sup>	75	4.9 ft <sup>3</sup>
4400M/8000	50	14.9 ft <sup>3</sup>	75	9.9 ft <sup>3</sup>
4400M/12000	50	22.2 ft <sup>3</sup>	75	14.9 ft <sup>3</sup>
4400M/16000	50	29.4 ft <sup>3</sup>	75	19.6 ft <sup>3</sup>

<u>RO System Model</u>	<u>Recovery %**</u>	<u>10 Min EBCT</u>	<u>Recovery %**</u>	<u>10 Min EBCT</u>
CWP 10167	8 ft <sup>3</sup>	-	-	-
CWP 10267	12 ft <sup>3</sup>	-	-	-
CWP 10467	16 ft <sup>3</sup>	-	-	-
CWP 10667	20 ft <sup>3</sup>	-	-	-

\* WRO flow rate based on 3 LPM minimum intake flow rate.

\*\* Recovery will vary as product flow varies depending on feed temperature, operating pressure and actual individual membrane performance up to 30% increase in flux. These factors should also be considered to determine the actual volume of carbon to be used.

NOTE: Percent recovery and volumes are based on the manufactures spec flow rates for thin film membranes.