

Battery Room Ventilation

June 18, 2015

INPUT

Project Name:	My Project Name	
Program User:	My Name Here	
Battery Room Floor Area, Sq. Ft.	1,000	
Room Height, Ft.	30	
Number of Batteries	15	
Amp-Hour Rating per Battery	850	Default: 850
Number of Cells per Battery	36	Default: 36
Maximum Hydrogen Concentration	1%	Default: 1%
Charging Hydrogen Release per Amp-Hour, Ft ³ /cell	0.01474	Default: 0.01474
Charging Hydrogen Release, Hours	4	Default: 4
Overcharge Assumption	20%	Default: 20%
Heat Removal (summertime), Air Changes per Hour	4	Default: 4

OUTPUT

Room Volume = 1000 x 30 =	30,000	Ft ³
Hydrogen Released per Battery =	$\frac{36 \text{ cells} \times 0.2 \times 0.01474 \times 850}{4 \text{ hours}} = 22.552 \text{ Ft}^3/\text{Hr}$	
Total Hydrogen Released =	22.552 Ft ³ /Hr x 15 Batteries =	338.283 Ft ³ /Hr
Continuous Battery Room Ventilation =	$\frac{30,000 \text{ Ft}^3 \times 0.01}{338.283 \text{ Ft}^3/\text{Hr}} \times 60$	
=	One air change every	53.2 minutes
Continuous Battery Room Ventilation =	$\frac{30,000}{53.2}$	= 564 CFM
Heat Removal Battery Room Ventilation =	$\frac{1,000 \text{ Ft}^2 \times 30 \text{ Ft} \times 4 \text{ Air Changes/Hr}}{60}$	
Heat Removal Battery Room Ventilation =	2,000	CFM

Heat Removal Battery Room Ventilation:	2,000	CFM
Continuous Battery Room Ventilation:	564	CFM