Ventilation system design

Response Attachment for RMP program audit - #3(OAC 3745-104-24.

VENTILATION SYSTEM – CHLORINE ROOMS

The 1 Ton Chlorine Cylinder Room is shared with a walkway opening to the Chemical Room(Potassium Permanganate). The two spaces are essentially, one with a fan located in the chlorine area and another fan located within proximity of the potassium permanganate area.

1 Ton Chlorine area, floor area = 176 s.f., Height = 10', Volume = 1,760 c.f.

Potassium Perman., floor area = 194 s.f. Height = 12'-8" Volume = 2,458 c.f.

200 lb. Chlorine area, floor area = 90 s.f. Height = 12'-8" Volume = 1,140 c.f.

Ventilation Fan Data: 18" diameter, 8 blade, corrosion resistant, CFM = 2,790, ¼ hp, 115 Volt

Air Changes Per Hour Calculated by:

$N = 60Q/Vol$

Where N = number of air changes per hour
Q = Volumetric flow rate of air, cfm
Vol = Space volume of room, c.f.

1 Ton Chlorine area: N = 60(2,790 c.f.m.)/1,760 c.f. = 95

Potassium perman. Area: N = 60(2,790 c.f.m.)/2,458 c.f. = 68

200 lb. Chlorine area: N = 60(2,790 c.f.m.)/1,140 c.f. = 146

SUMMARY

10 States Standards, 2007 Edition, recommends each chlorine room shall have ventilation with a capacity to provide 60 complete air changes per hour when the room is occupied. The above calculated areas have 95, 68, and 146 air changes per hour. All areas exceed the recommended 60 air changes per hour benchmark.

June 17, 2011