

Chapter 5 of Heinsohn & Cimbala: Clean Room Figures and Tables

John M. Cimbala, Penn State University. Latest update: 03 November 2017

Clean Rooms [Section 5.9]:

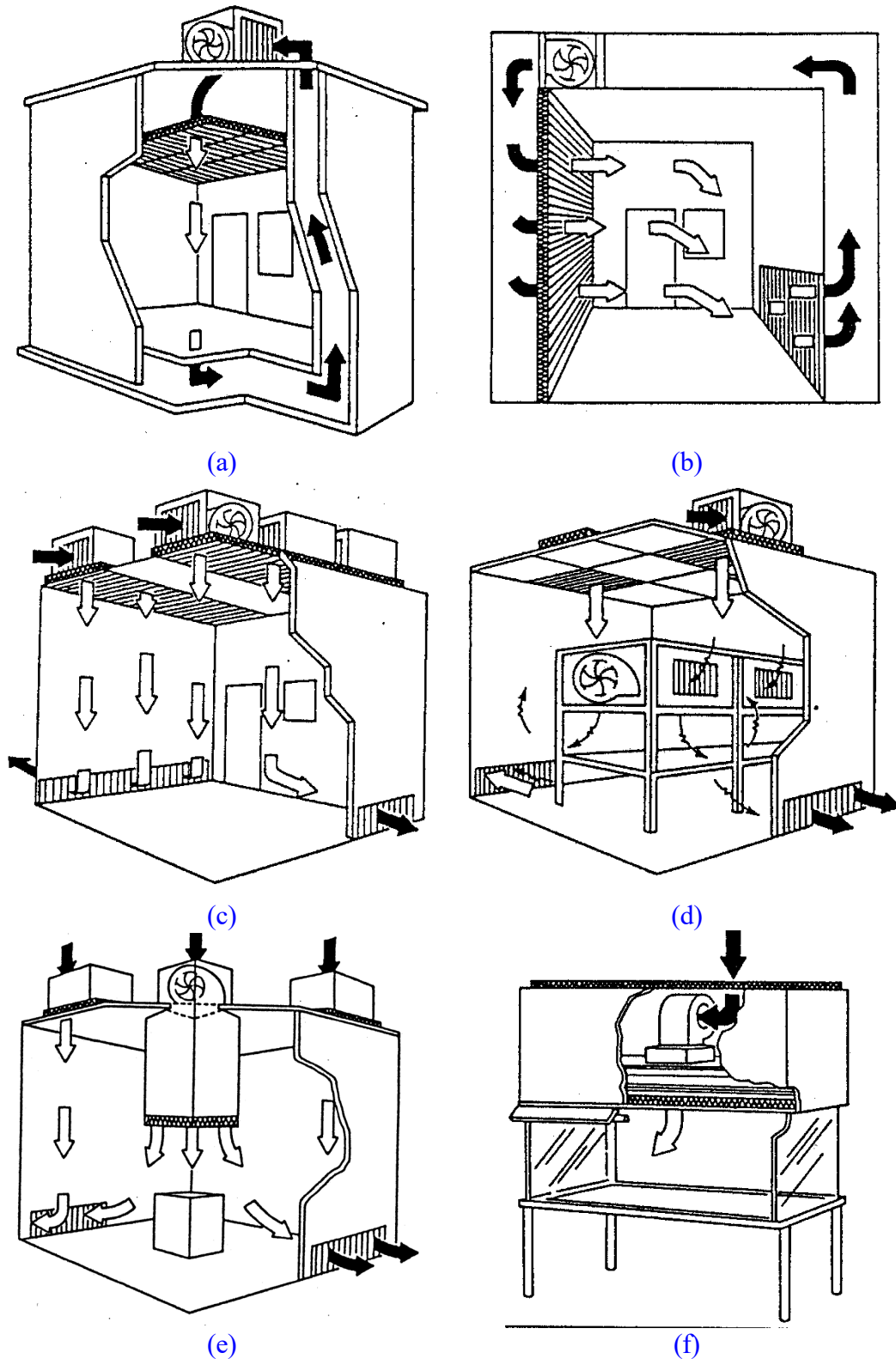


Figure 5.11 Clean rooms: (a) vertical laminar-flow, (b) horizontal laminar-flow, (c) tunnel laminar-flow, (d) tabletop tunnel laminar-flow, (e) island laminar-flow, and (f) unitary work station (miniature) (from Canon Communications, 1987).

Table 5.2 Clean room class limits; maximum permissible c_{number} in English and SI units; **bold** c_{number} indicates number concentration on which the corresponding **bold** class name is based (abstracted from ASHRAE HVAC Applications Handbook, 1999.)

| Class name | | $D_p \geq 0.1 \mu\text{m}$ | | $D_p \geq 0.2 \mu\text{m}$ | | $D_p \geq 0.5 \mu\text{m}$ | | $D_p \geq 5 \mu\text{m}$ | |
|------------|---------------|----------------------------|-------------------|----------------------------|-------------------|----------------------------|-------------------|--------------------------|-------------------|
| SI | English | #/m ³ | #/ft ³ | #/m ³ | #/ft ³ | #/m ³ | #/ft ³ | #/m ³ | #/ft ³ |
| M1 | | 350 | 9.9 | 75.0 | 2.14 | 10¹ | 0.283 | - | - |
| M1.5 | 1 | 1240 | 35 | 265 | 7.5 | 35.3 | 1 | - | - |
| M2 | | 3500 | 99.1 | 757 | 21.4 | 10² | 2.83 | - | - |
| M2.5 | 10 | 12400 | 350 | 2650 | 75.0 | 353 | 10 | - | - |
| M3 | | 35000 | 991 | 7570 | 214 | 10³ | 28.3 | - | - |
| M3.5 | 100 | - | - | 26500 | 750 | 3530 | 100 | - | - |
| M4 | | - | - | 75700 | 2140 | 10⁴ | 283 | - | - |
| M4.5 | 1000 | - | - | - | - | 35300 | 1000 | 247 | 7.00 |
| M5 | | - | - | - | - | 10⁵ | 2830 | 618 | 17.5 |
| M5.5 | 10000 | - | - | - | - | 353000 | 10000 | 2470 | 70.0 |
| M6 | | - | - | - | - | 10⁶ | 28300 | 6180 | 175 |
| M6.5 | 100000 | - | - | - | - | 3530000 | 100000 | 24700 | 700 |
| M7 | | - | - | - | - | 10⁷ | 283000 | 61800 | 1750 |

We plot the data of Table 5.2 below:

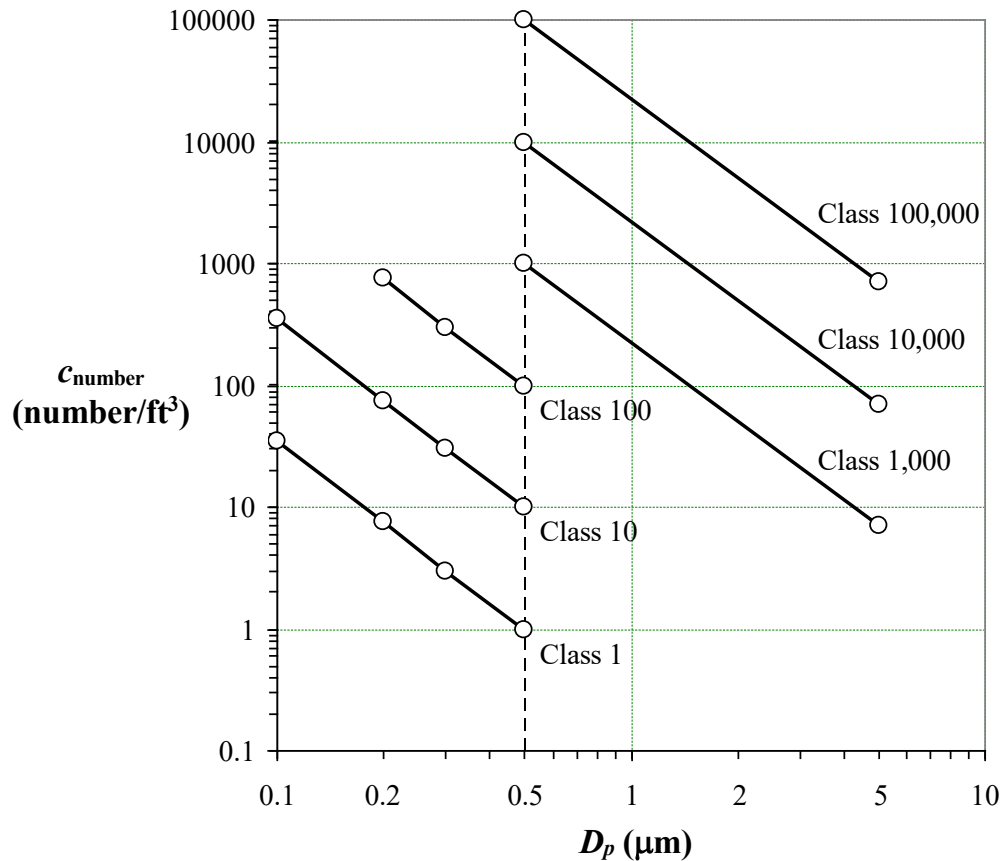


Figure 5.12 Class definitions for clean rooms in the US; class based on cubic feet – conversion: 1.00 particles/ft³ = 35.3 particles/m³.