

### Heat Gain Data

| Item   | R Value, | Watts | Btu/hr | Remarks (2)                   |
|--|----------|-------|--------|-------------------------------|
| <b>Envelope</b>                              |          |       |        |                               |
| Inside Film Resistance                       | 0.68     |       |        |                               |
| Outside Film Resistance (1)                  | 0.68     |       |        |                               |
| Metal Surface                                | 0        |       |        |                               |
| Wall Air Space                               | 0.87     |       |        |                               |
| Ceiling Tile, Mineral Fiberboard 3/4"        | 1.79     |       |        |                               |
| Aluminum panel, PVC Fluted Core, 1/4"        | 0.44     |       |        |                               |
| Melamine MDF Core, 1/4"                      | 0.23     |       |        |                               |
| <b>Equipment</b>                             |          |       |        |                               |
| MAC 10- IQ, low energy                       |          | 125   |        |                               |
| MAC 10 Original                              |          | 220   |        |                               |
| Motors, energy to room, per horsepower       |          | 900   |        | Check ASHRAE Guide (2)        |
| Computers and displays                       |          | 150   |        |                               |
| Process Equipment                            |          | ???   |        |                               |
| <b>Lighting</b>                              |          |       |        |                               |
| Lay-in fixture, energy to room air, per lamp |          | 32    |        |                               |
| <b>Outdoor Air, per CFM</b>                  |          |       | 84     | Minnesota air, 95/78 to 55/54 |

Notes:  
 (1) Outside film coefficient is the same as the inside, since we build cleanrooms inside a building space.  
 (2) Use this spreadsheet for small cleanrooms. For larger cleanrooms, use professional engineers to calculate the heat gains.