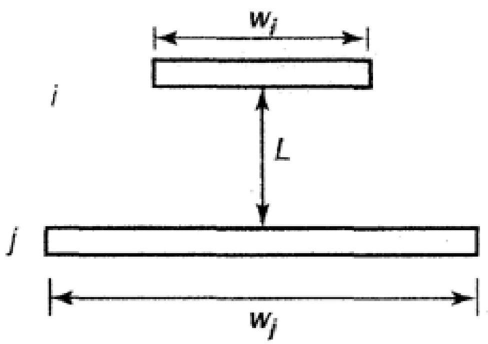
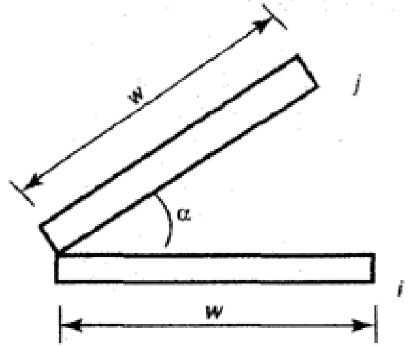
(i) Parallel plates with mid-lines connected by perpendicular



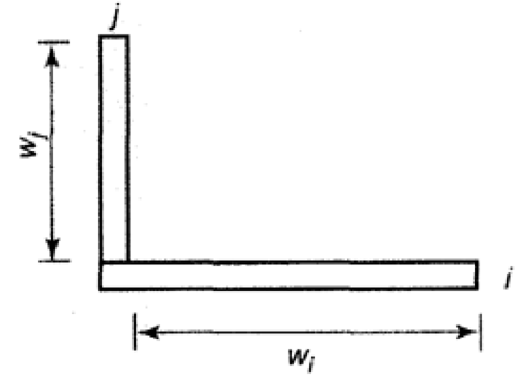

$F_{ij} = \{[(W_i + W_j)^2 + 4]^{0.5} - [(W_j - W_i)^2 + 4]^{0.5}\}/2W_i$
where: $W_i = W_i/L$ and $W_j = W_j/L$

(ii) Inclined parallel plates of equal width and a common edge



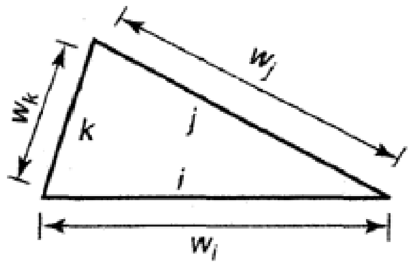

$F_{ij} = 1 - \sin(\alpha/2)$

(iii) Perpendicular plates with a common edge



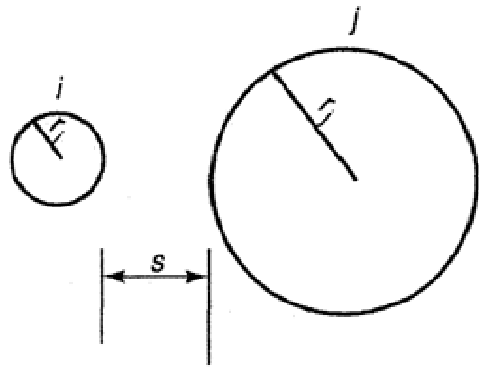

$F_{ij} = \{1 + (w_j/w_i) - [1 + (w_j/w_i)^2]^{0.5}\}/2$

(iv) Three-sided enclosure




$F_{ij} = (w_i + w_j - w_k)/2w_i$

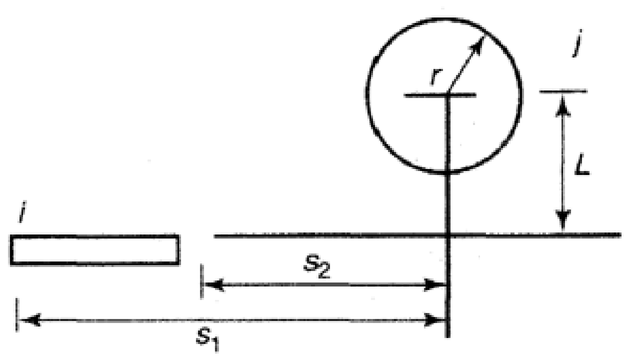
(v) Parallel cylinders of different radius




$F_{ij} = (1/2\pi)\{-\pi + [C^2 - (R+1)^2]^{0.5} - [C^2 - (R-1)^2]^{0.5} + (R-1)\cos^{-1}[(R/C) - (1/C)] - (R+1)\cos^{-1}[(R/C) + (1/C)]\}$

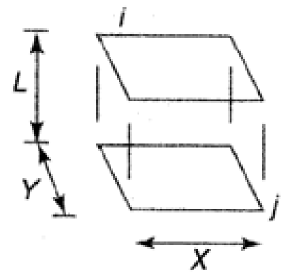
where: $R = r_j/r_i$, $S = s/r_i$ and $C = 1 + R + S$

(vi) Cylinder and parallel rectangle




$F_{ij} = [r/(s_1 - s_2)][\tan^{-1}(s_1/L) - \tan^{-1}(s_2/L)]$

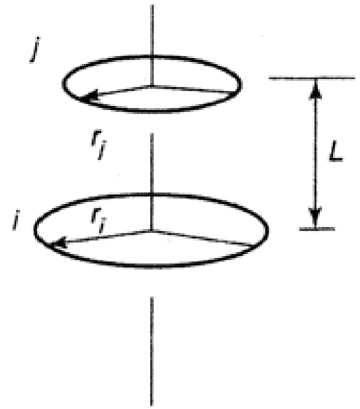
(i) Aligned parallel rectangles




$$F_{ij} = [2/(\pi\bar{X}\bar{Y})]\{\ln[(1+\bar{X}^2)(1+\bar{Y}^2)/(1+\bar{X}^2+\bar{Y}^2)]^{0.5}$$
$$+\ \bar{X}(1+\bar{Y}^2)^{0.5}\tan^{-1}[\bar{X}/(1+\bar{Y}^2)^{0.5}]$$
$$+\ \bar{Y}(1+\bar{X}^2)^{0.5}\tan^{-1}[(\bar{Y}/(1+\bar{X}^2)^{0.5})-\bar{X}\ \tan^{-1}\bar{X}-\bar{Y}\tan^{-1}\bar{Y}\}$$

where: $\bar{X} = X/L$ and $\bar{Y} = Y/L$

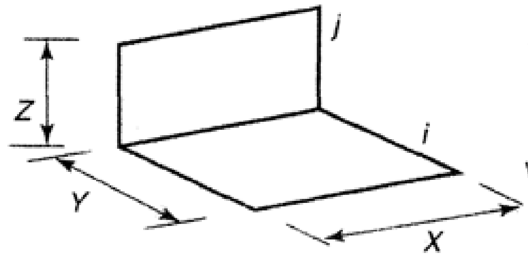
(ii) Coaxial parallel discs




$$F_{ij} = 0.5\{S-[S^2-4(r_j/r_i)^2]^{0.5}\}$$

where: $R_i = r_i/L$, $R_j = r_j/L$ and
$S = 1+(1+R_j^2)/R_i^2$

(iii) Perpendicular rectangles with a common edge

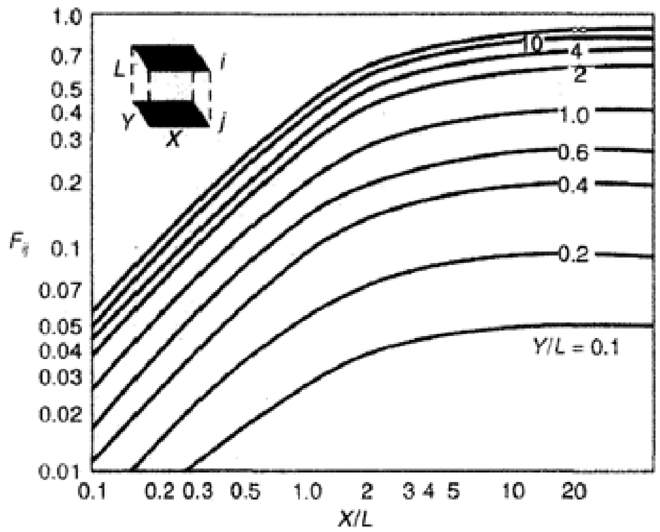



$$F_{ij} = (1/\pi W)\{W\tan^{-1}(1/W)+H\tan^{-1}(1/H)-(H^2+W^2)^{0.5}\tan^{-1}(H^2+W^2)^{-0.5}$$
$$+\ 0.25\ln[(1+W^2)(1+H^2)/(1+W^2+H^2)][W^2(1+W^2+H^2)/(1+W^2)(W^2+H^2)]W^2$$
$$\times[H^2(1+H^2+W^2)/(1+H^2)(H^2+W^2)]H^2]\}$$

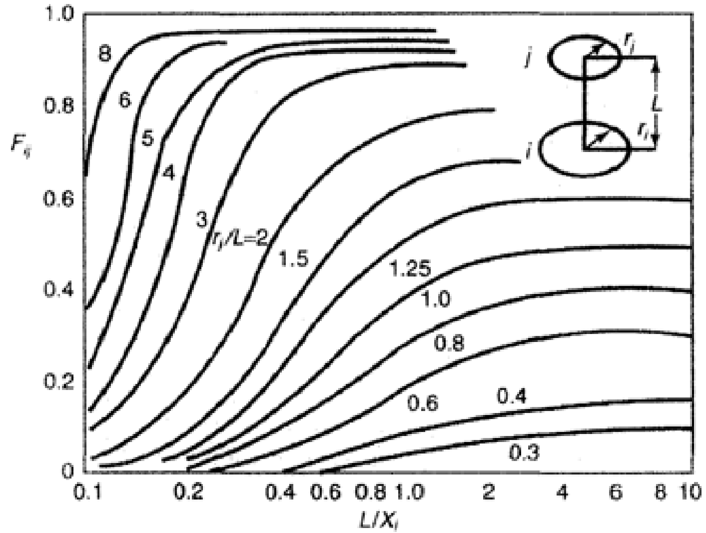
where: H=Z/X and W=Y/X

Figure 9.39. View factors for three-dimensional geometries[45]

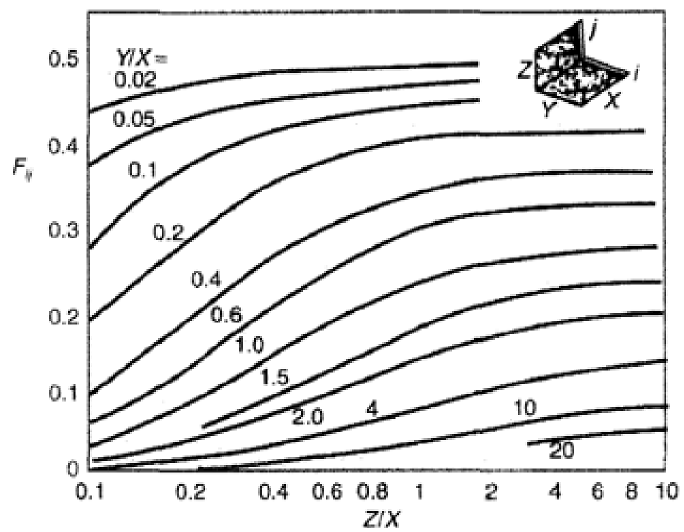
(i) Aligned parallel rectangles



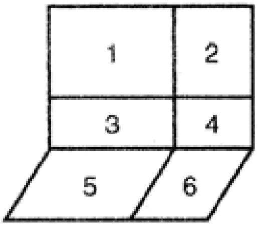

(ii) Co-axial parallel discs




(iii) Perpendicular rectangles with a common edge

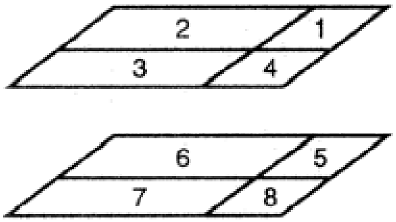


(i) Two perpendicular rectangles
– between surfaces 1 and 6



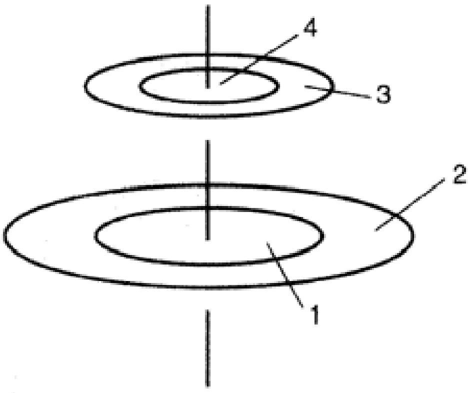

$$F_{16} = (A_6/A_1)[(1/2A_6)(A_{(1+2+3+4)}F_{(1+2+3+4)(5+6)}$$
$$+ A_6F_{6(2+4)} - A_5F_{5(1+3)} - (1/2A_6)(A_{(3+4)}F_{(3+4\times 5+6)}$$
$$- A_6F_{6A} - A_5F_{53})]$$

(ii) Two parallel rectangles
– between surfaces 1 and 7



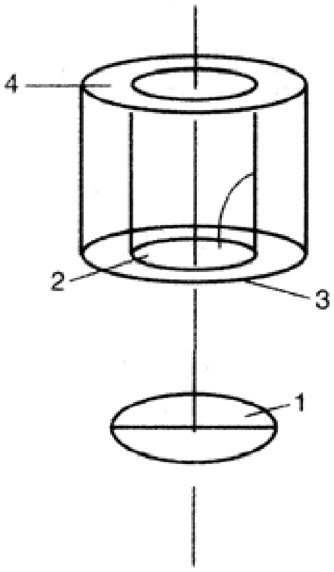

$$F_{17} = (1/4A_1)[A_{(1+2+3+4)}F_{(1+2+3+4)(5+6+7+8)}+A_1F_{15}+A_2F_{26}$$
$$+ A_3F_{37} + A_4F_{48}] - (1/4A_1)[A_{(1+2)}F_{(1+2)(5+6)}+A_{(1+4)}F_{(1+4)(5+8)}$$
$$+ A_{(3+4)}F_{(3+4)(7+8)} + A_{(2+3)}F_{(2+3)(6+7)}]$$

(iii) Two parallel circular rings
– between surfaces 2 and 3




$$F_{23} = (A_{(1+2)}/A_2)[F_{(1+2)(3+4)} - F_{(1+2)4}]$$
$$+ (A_1/A_2)[F_{1(3+4)} - F_{14}]$$

(iv) A circular tube and a disc between surface 3,
the inner wall of the tube of radius $x_3$ and surface 1,
the upper surface of the disc of radius $x_1$.




$$F_{13} = F_{12} - F_{14}$$
$$F_{31} = (x_3^2/x_1^2)(F_{12} + F_{14})$$