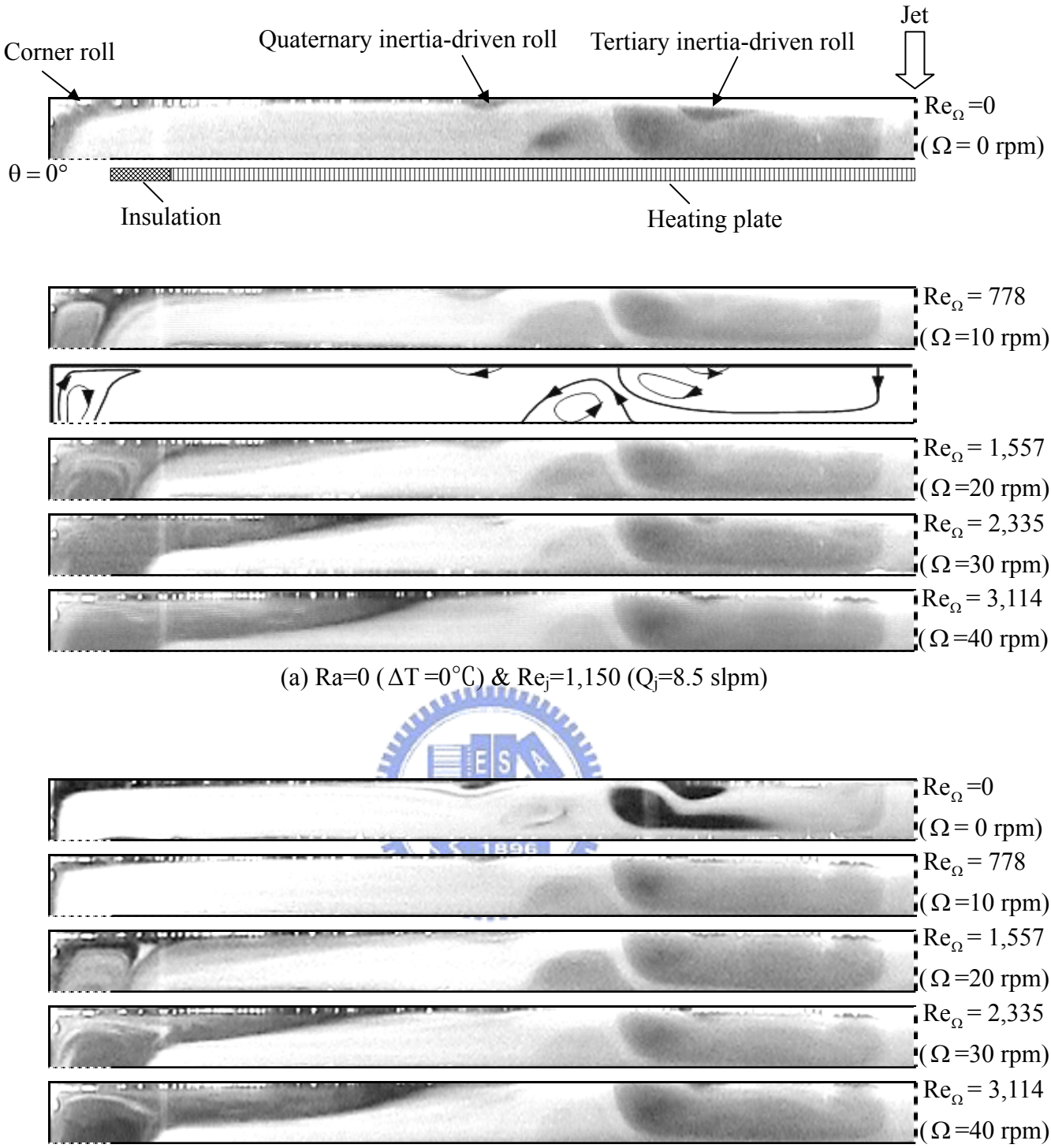
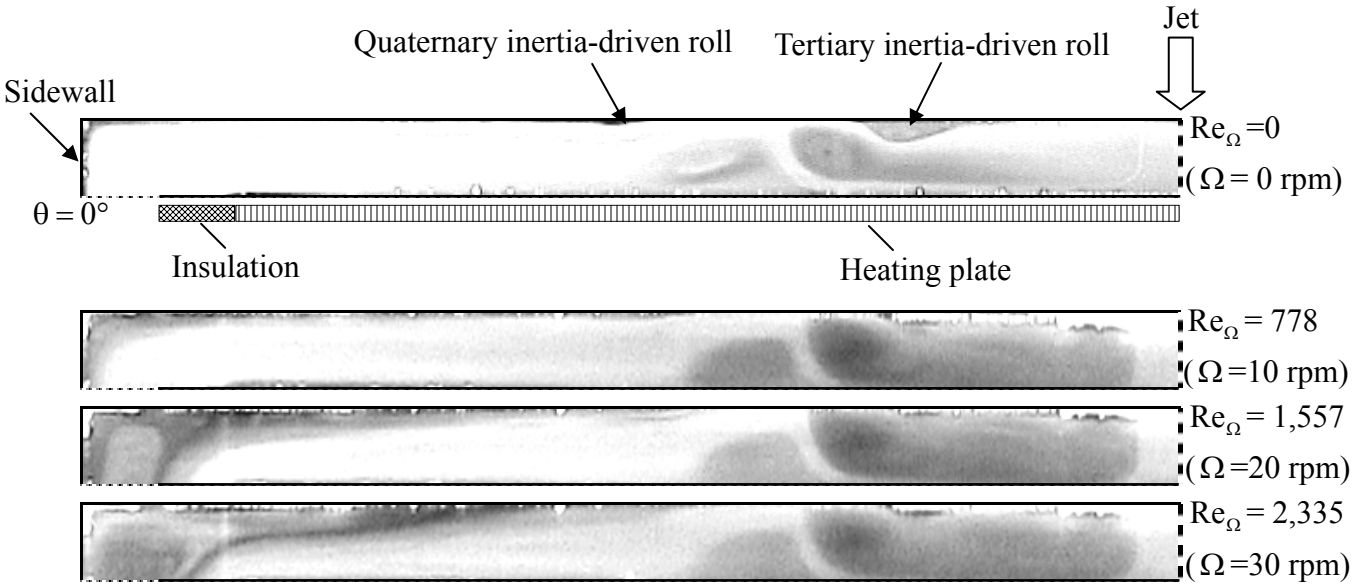
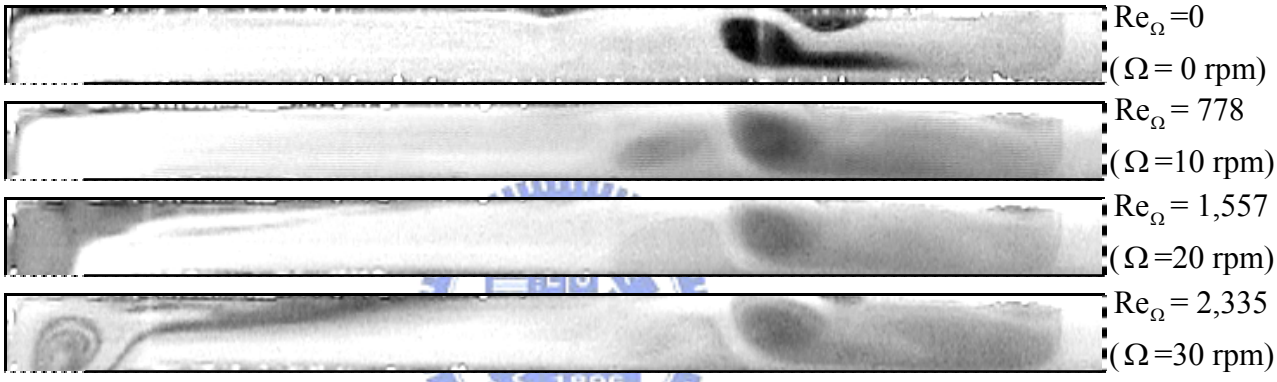


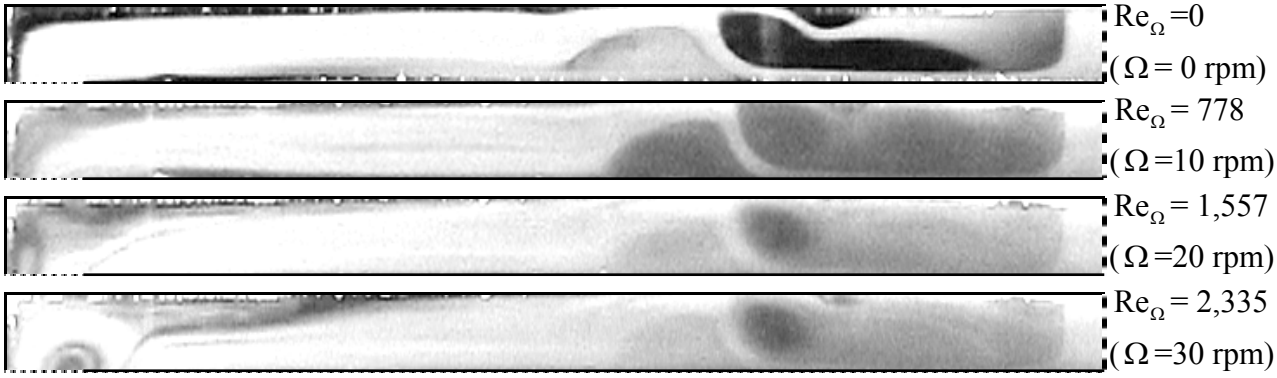
Fig. 4.18 Steady side view flow photos taken at the cross plane $\theta = 0^\circ$ for Re$_j$=1,150 (Q$_j$=8.5 slpm) for various rotational Reynolds numbers at H=10.0 mm for (a) Ra=0 (ΔT =0°C) and (b) Ra=470 (ΔT =5.0°C), (c) Ra=940 (ΔT =10.0°C), (d) Ra=1,410 (ΔT =15.0°C), and (e) Ra=1,880 (ΔT =20.0°C).



(c) Ra=940 (ΔT =10.0℃) & Re_j=1,150 (Q_j=8.5 slpm)



(d) Ra=1,410 (ΔT =15.0℃) & Re_j=1,150 (Q_j=8.5 slpm)



(e) Ra=1,880 (ΔT =20.0℃) & Re_j=1,150 (Q_j=8.5 slpm)

Fig. 4.18 Continued

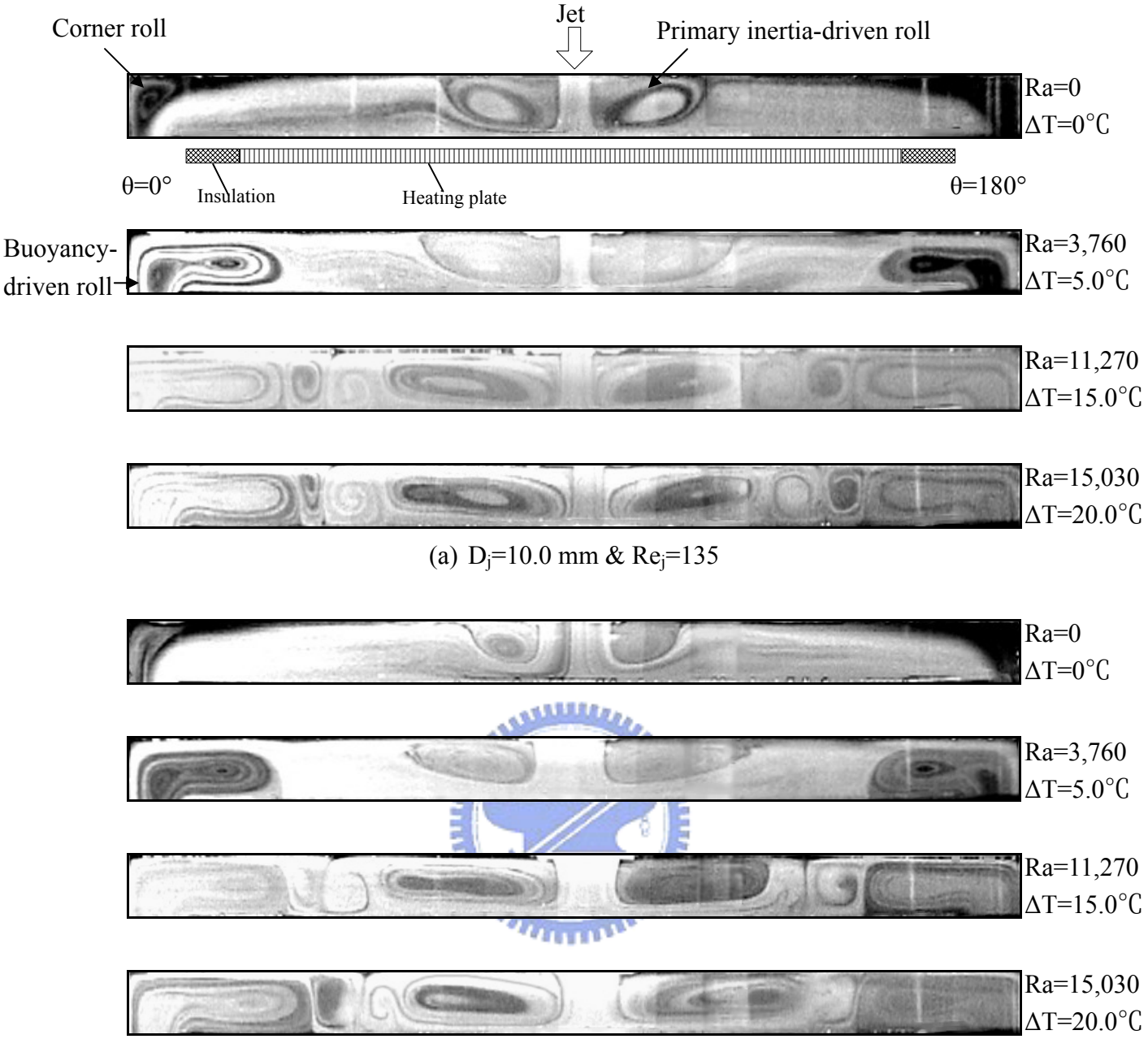
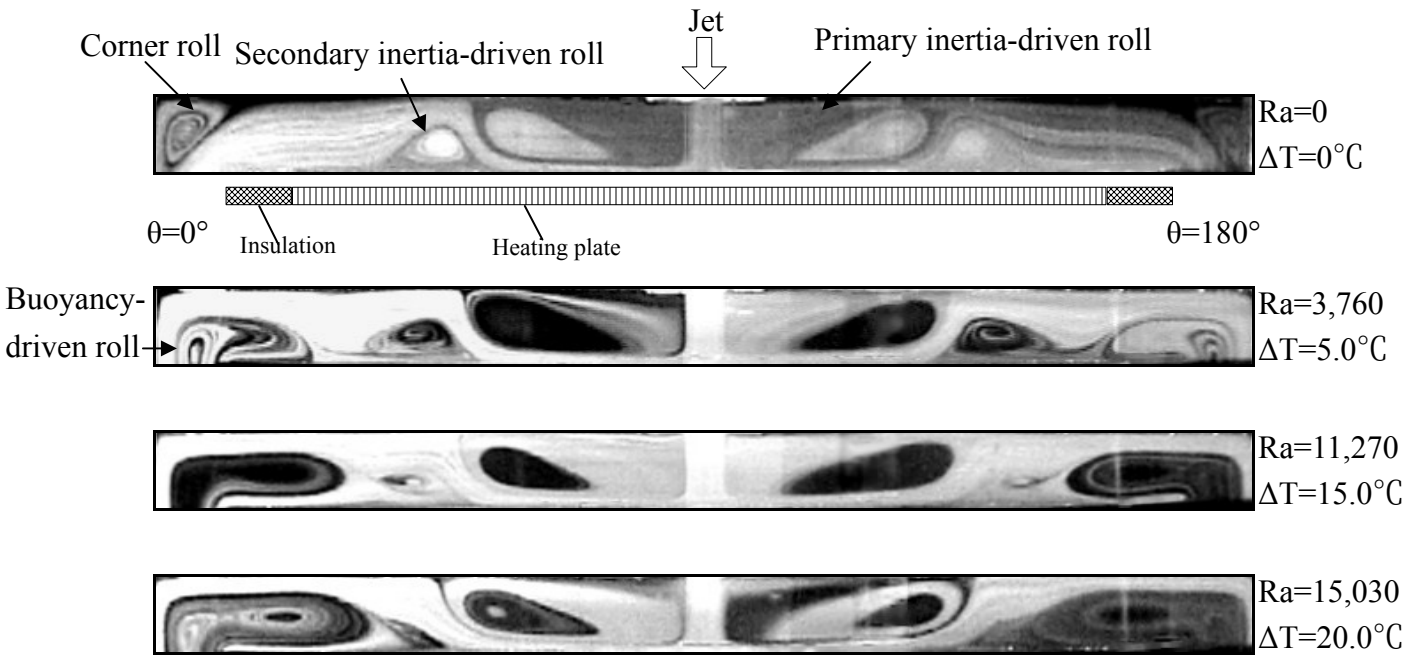
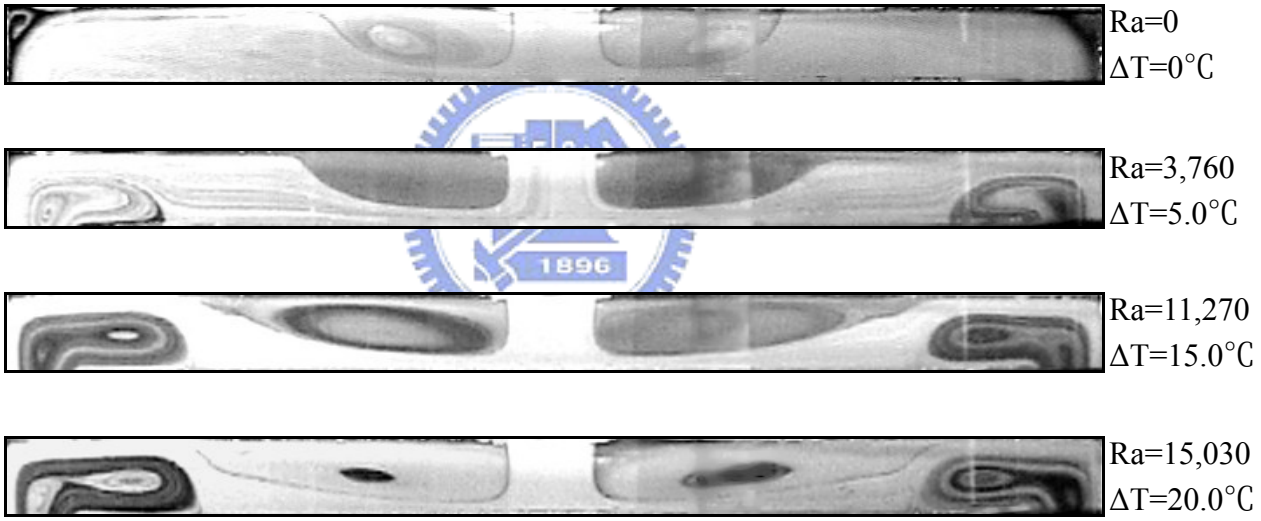


Fig. 4.19 Side view flow photos taken at the cross plane $\theta = 0^\circ$ & 180° for various Rayleigh numbers at Q_j = 1.0 slpm and Re_Ω = 0 (Ω = 0 rpm) for (a) D_j =10.0 mm & Re_j =135 and (b) D_j= 22.1 mm & Re_j =61.

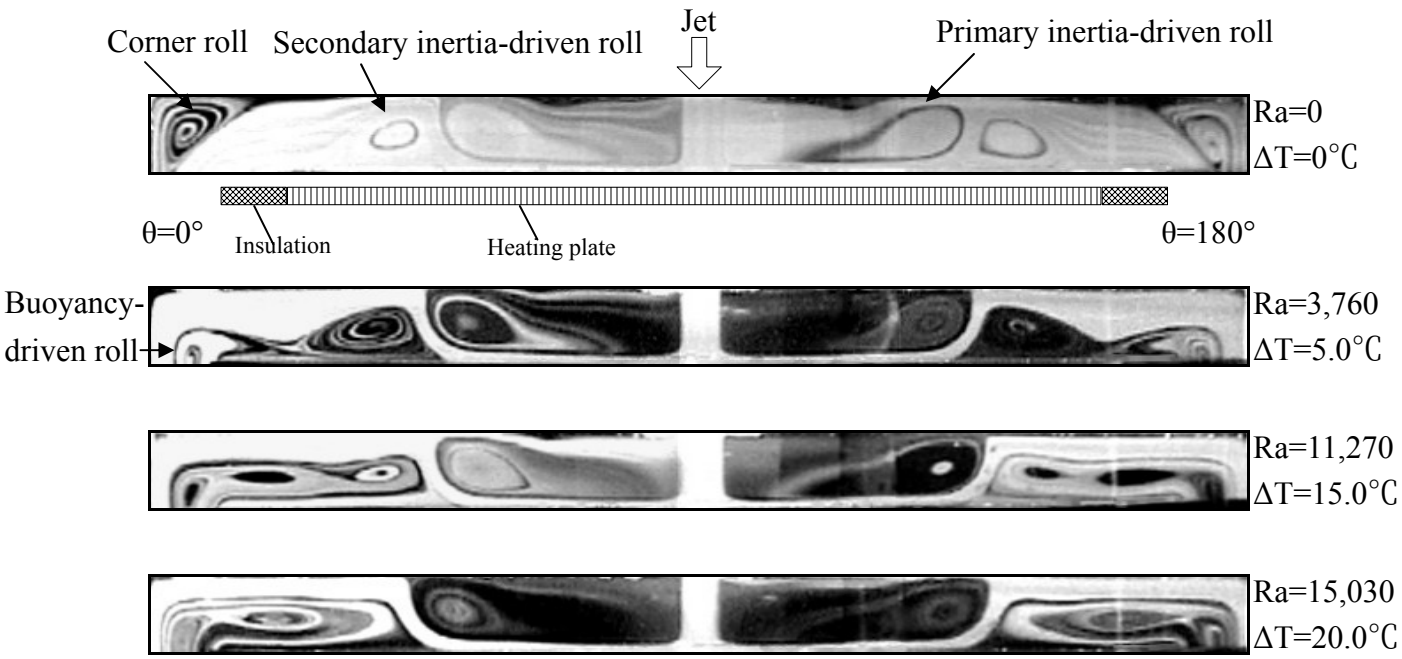


(a) D_j=10.0 mm & Re_j=406

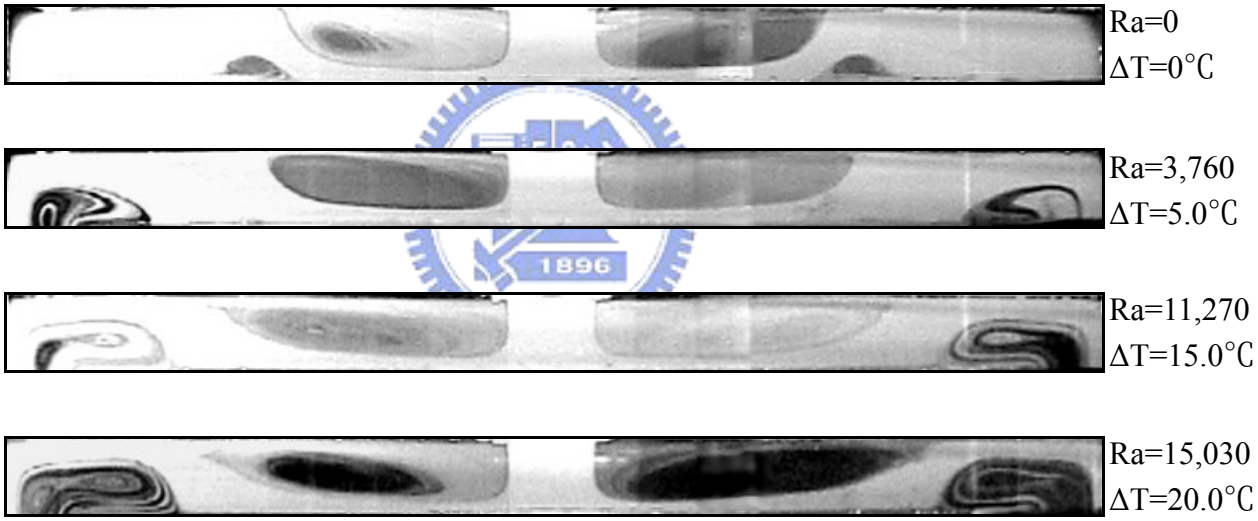


(b) D_j=22.1 mm & Re_j=184

Fig. 4.20 Steady side view flow photos taken at the cross plane $\theta = 0^\circ$ & 180° for various Rayleigh numbers at Q_j = 3.0 slpm and Re_Ω =0 (Ω = 0 rpm) for (a) D_j =10.0 mm & Re_j = 406 and (b) D_j =22.1 mm & Re_j = 184.

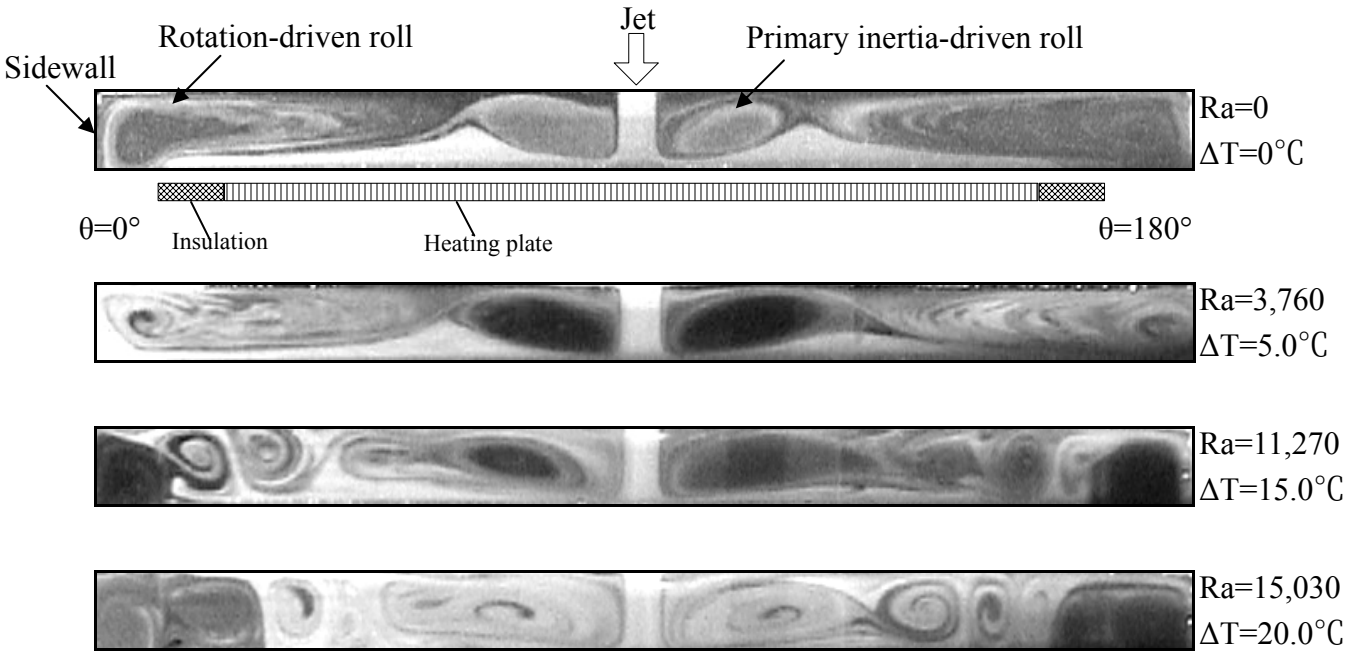


(a) D_j=10.0 mm & Re_j=676

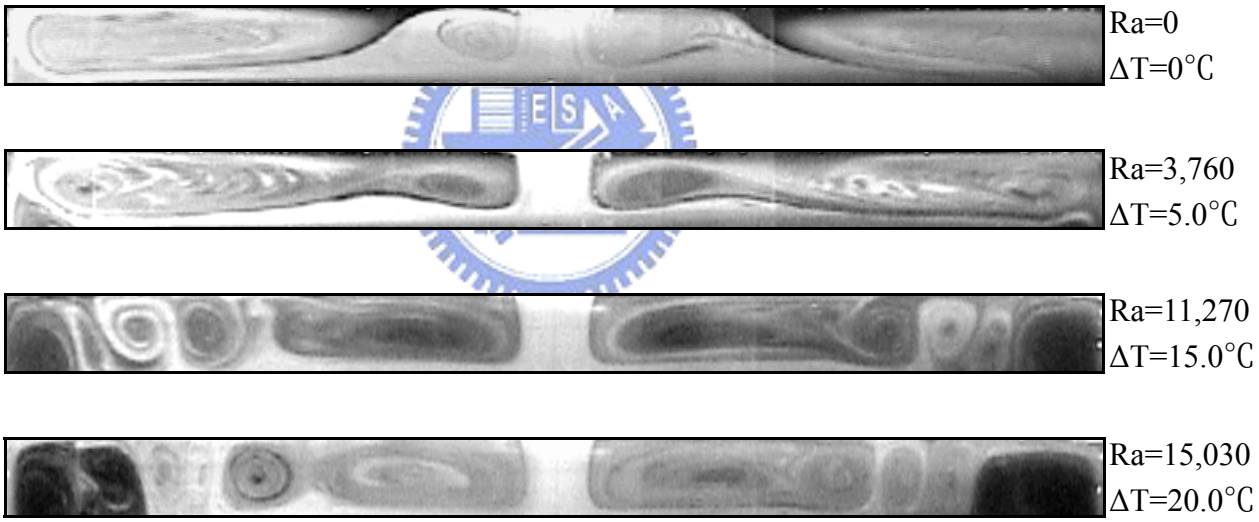


(b) D_j=22.1 mm & Re_j=306

Fig. 4.21 Steady side view flow photos taken at the cross plane $\theta = 0^\circ$ & 180° for various Rayleigh numbers at Q_j = 5.0 slpm and Re_Ω = 0 (Ω = 0 rpm) for (a) D_j = 10.0 mm & Re_j = 676 and (b) D_j = 22.1 mm & Re_j = 306.

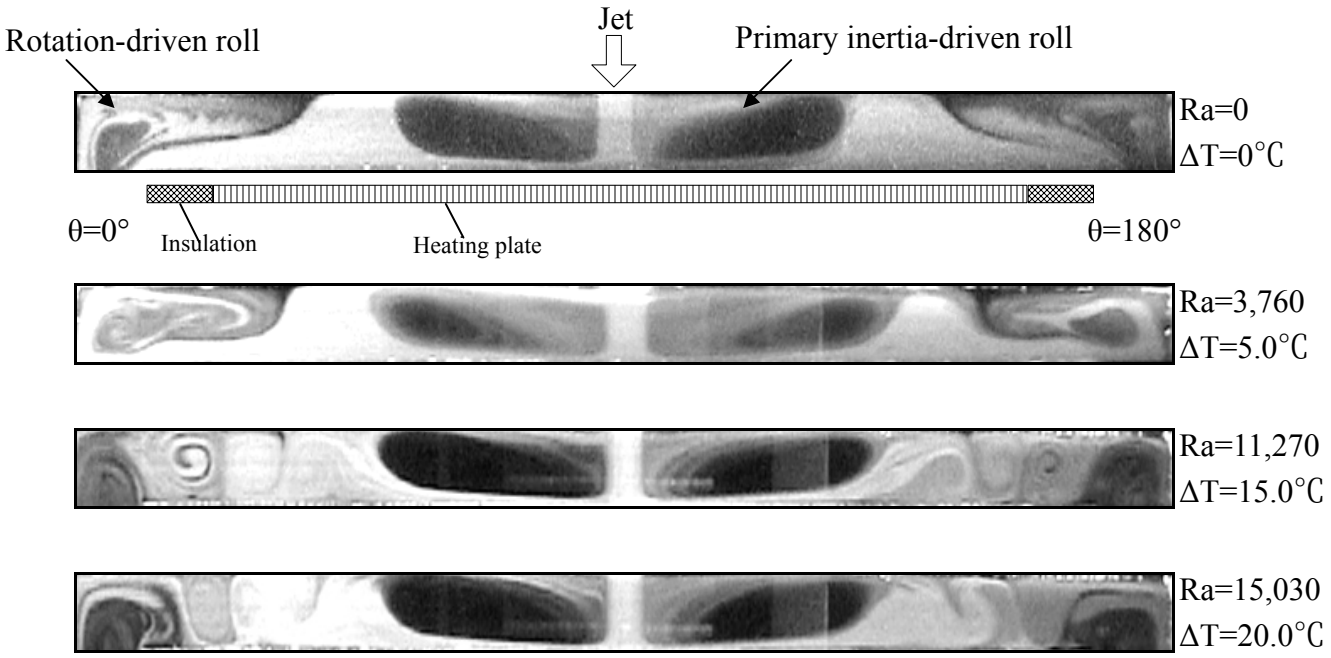


(a) D_j=10.0 mm & Re_j=135

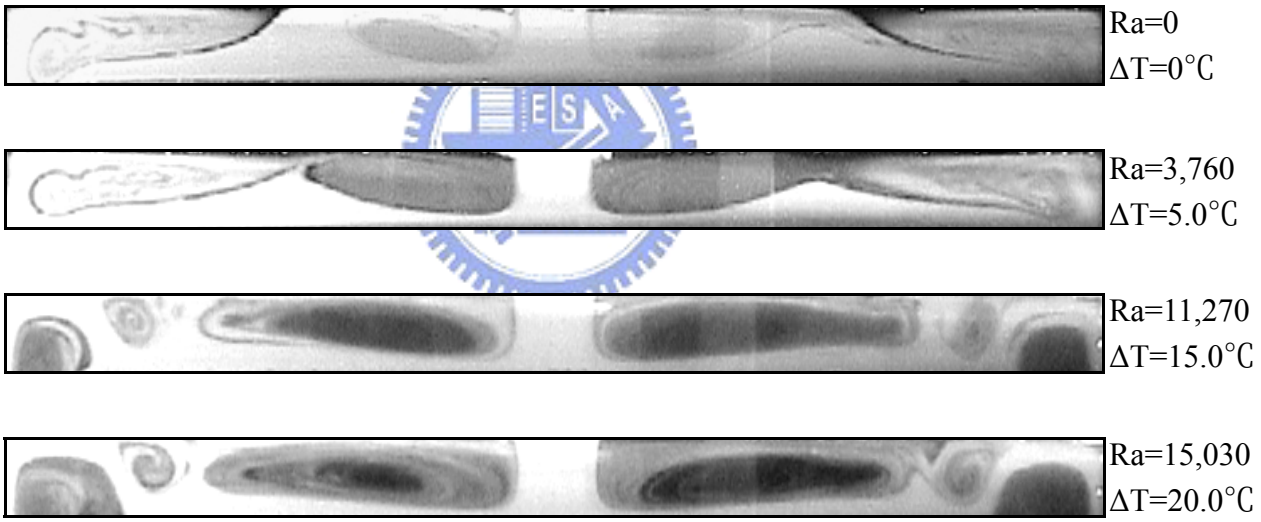


(b) D_j=22.1 mm & Re_j=61

Fig. 4.22 Side view flow photos taken at the cross plane $\theta = 0^\circ$ & 180° for various Rayleigh numbers at Q_j = 1.0 slpm and Re_Ω = 778 (Ω = 10 rpm) for (a) D_j =10.0 mm & Re_j =135 and (b) D_j = 22.1 mm & Re_j =61.

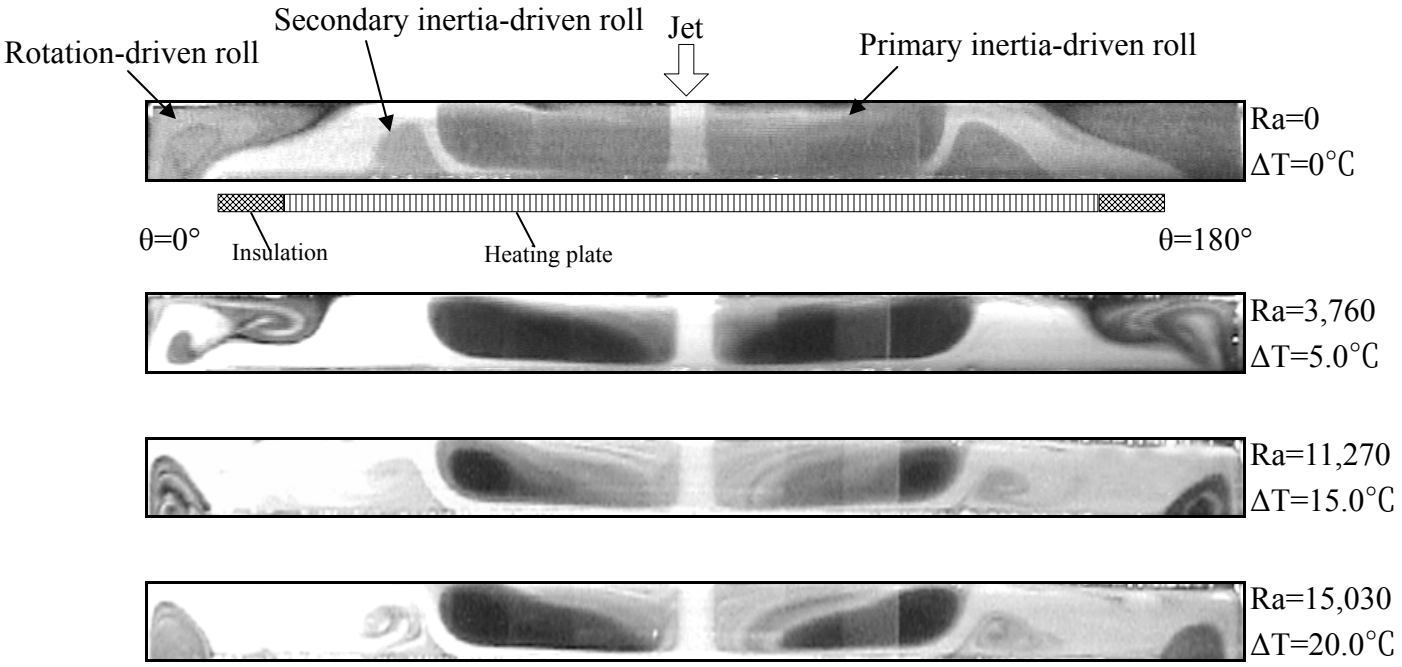


(a) D_j=10.0 mm & Re_j=406

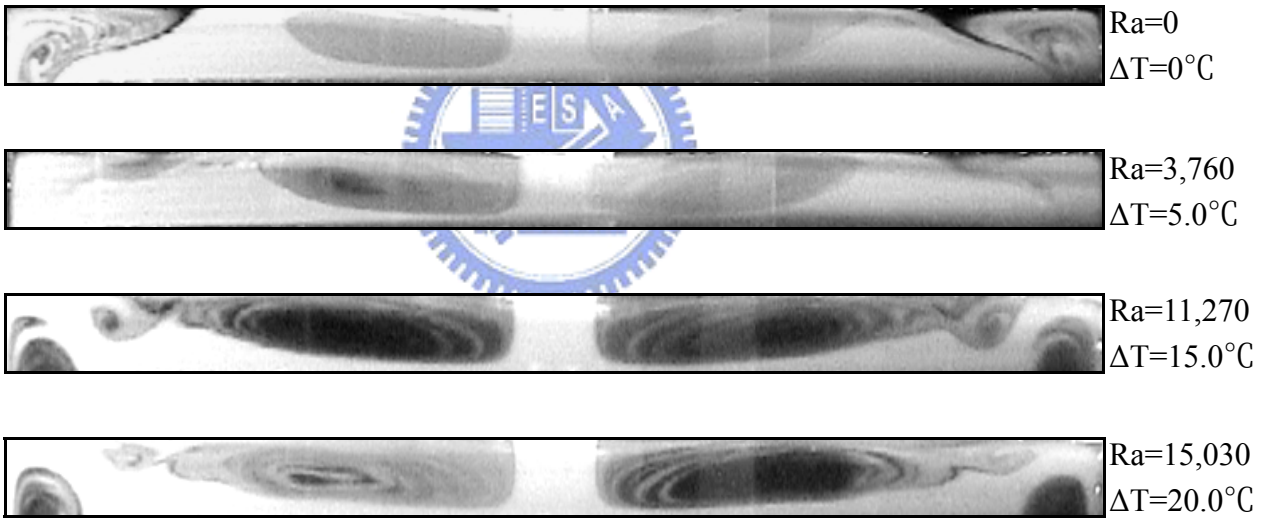


(b) D_j=22.1 mm & Re_j=184

Fig. 4.23 Side view flow photos taken at the cross plane $\theta = 0^\circ$ & 180° for various Rayleigh numbers at Q_j = 3.0 slpm and Re_Ω =778 (Ω = 10 rpm) for (a) D_j =10.0 mm & Re_j = 406 and (b) D_j =22.1 mm & Re_j = 184.

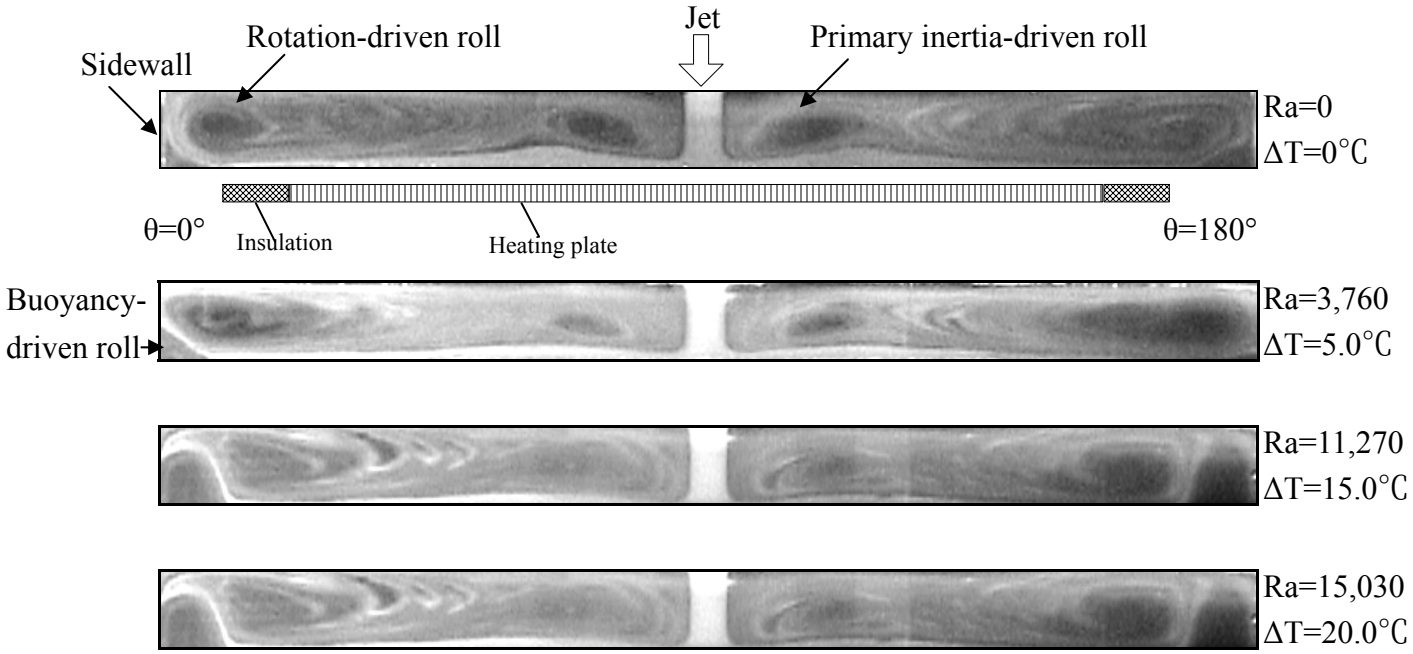


(a) D_j=10.0 mm & Re_j=676

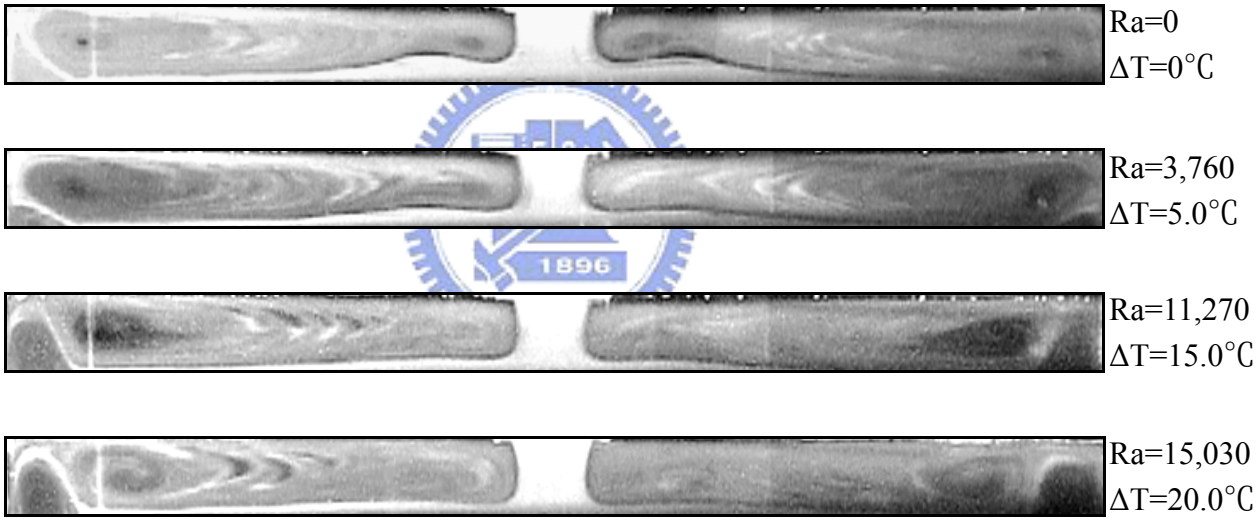


(b) D_j=22.1 mm & Re_j=306

Fig. 4.24 Side view flow photos taken at the cross plane $\theta = 0^\circ$ & 180° for various Rayleigh numbers at Q_j = 5.0 slpm and Re_Ω = 778 (Ω = 10 rpm) for (a) D_j = 10.0 mm & Re_j = 676 and (b) D_j = 22.1 mm & Re_j = 306.

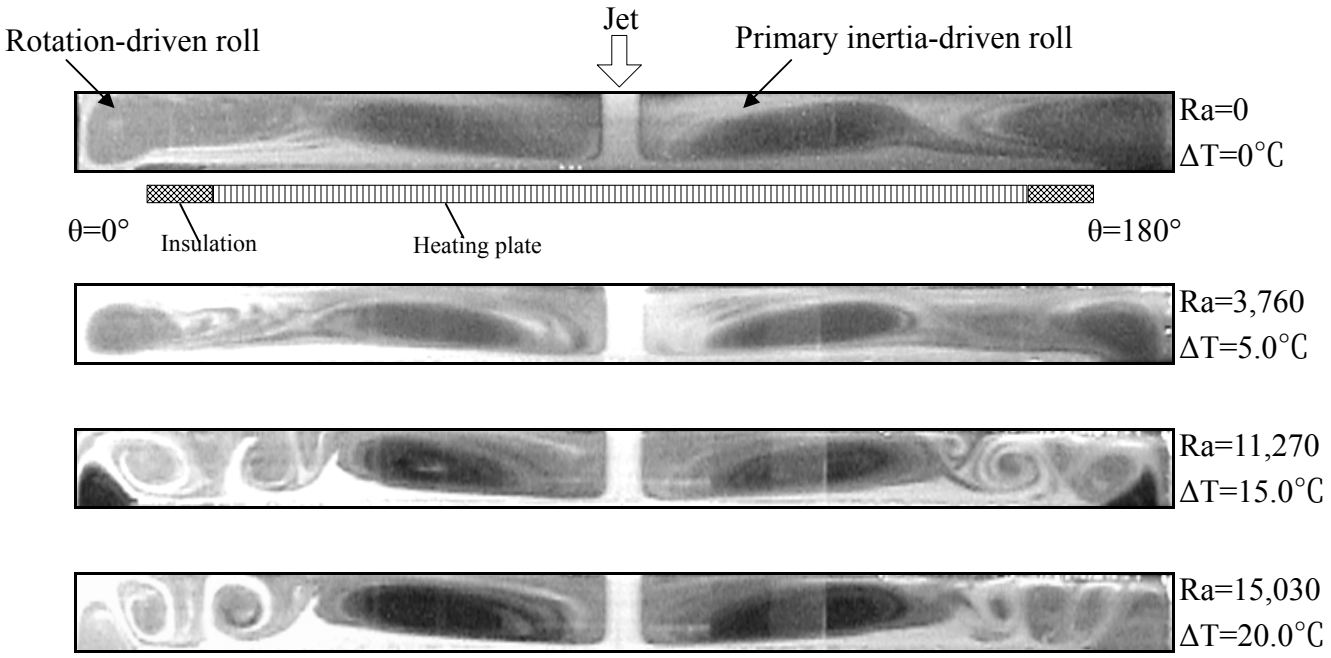


(a) D_j=10.0 mm & Re_j=135

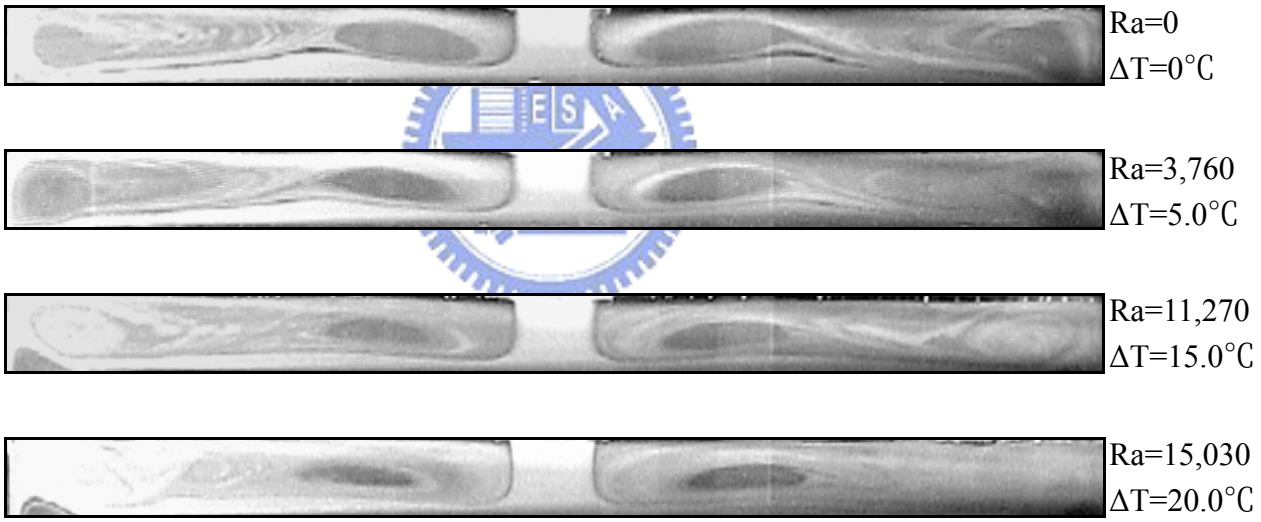


(b) D_j=22.1 mm & Re_j=61

Fig. 4.25 Steady side view flow photos taken at the cross plane $\theta = 0^\circ$ & 180° for various Rayleigh numbers at Q_j = 1.0 slpm and Re_Ω = 1,557 (Ω = 20 rpm) for (a) D_j =10.0 mm & Re_j =135 and (b) D_j = 22.1 mm & Re_j =61.

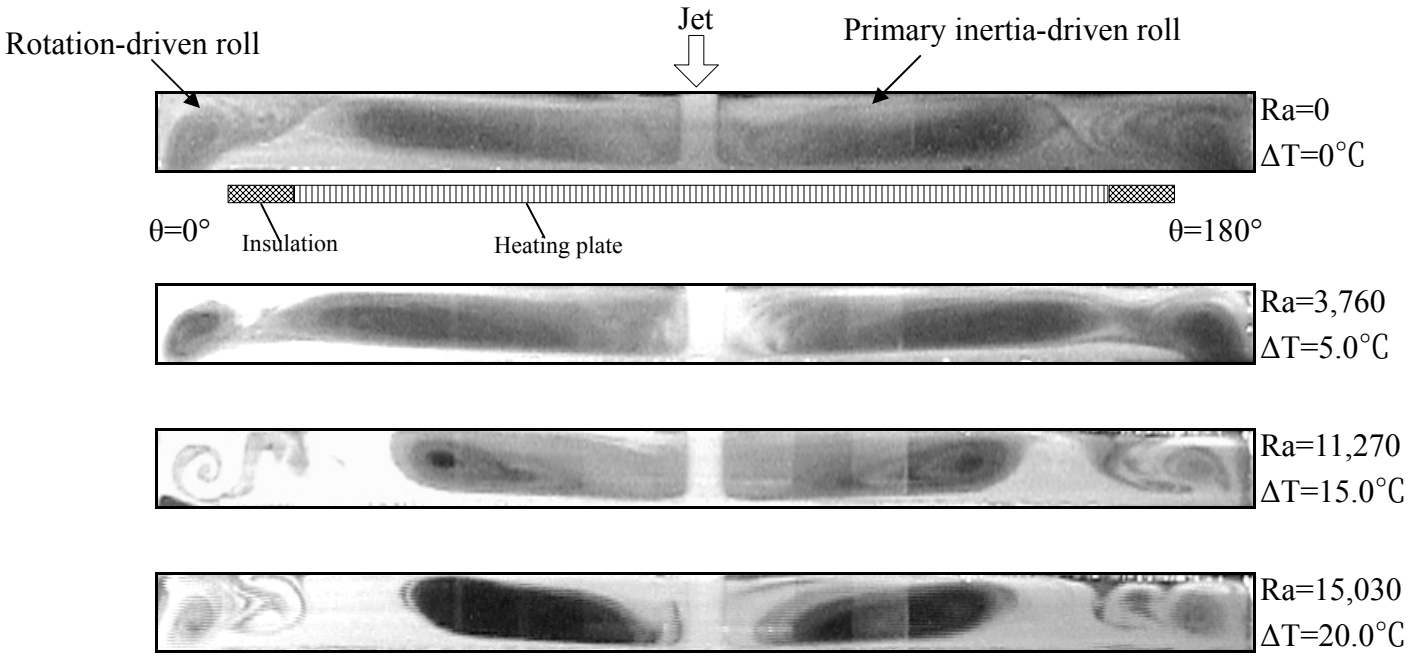


(a) D_j=10.0 mm & Re_j=406

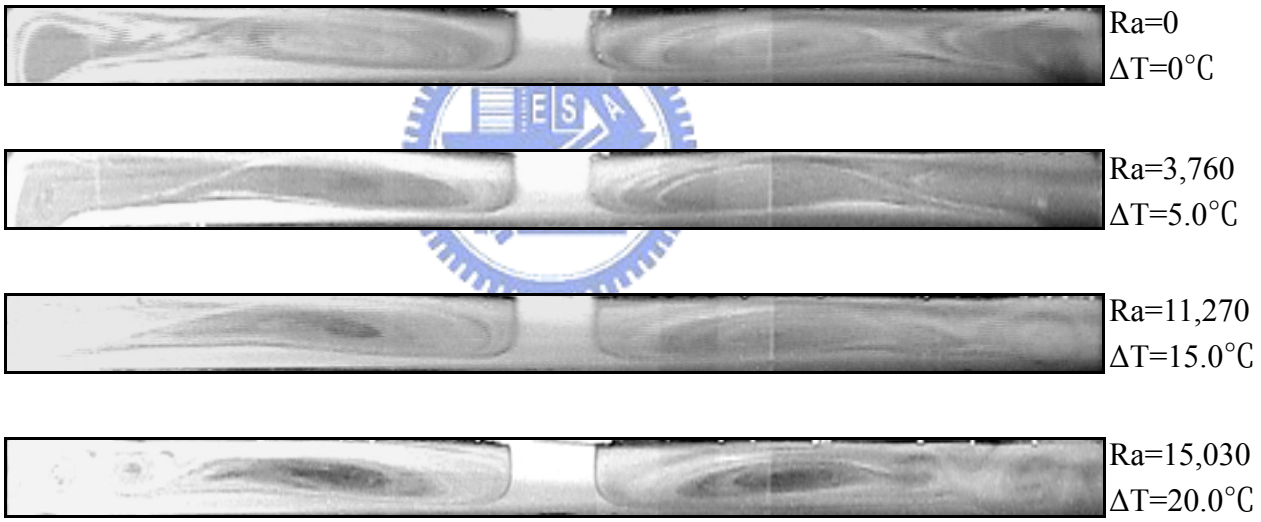


(b) D_j=22.1 mm & Re_j=184

Fig. 4.26 Side view flow photos taken at the cross plane $\theta = 0^\circ$ & 180° for various Rayleigh numbers at Q_j = 3.0 slpm and Re_Ω =1,557 (Ω = 20 rpm) for (a) D_j = 10.0 mm & Re_j = 406 and (b) D_j =22.1 mm & Re_j = 184.



(a) D_j=10.0 mm & Re_j=676



(b) D_j=22.1 mm & Re_j=306

Fig. 4.27 Side view flow photos taken at the cross plane $\theta = 0^\circ$ & 180° for various Rayleigh numbers at Q_j = 5.0 slpm and Re_Ω = 1,557 (Ω = 20 rpm) for (a) D_j = 10.0 mm & Re_j = 676 and (b) D_j = 22.1 mm & Re_j = 306.