

**THERMAL EFFICIENCY IMPROVEMENT OF AN LPG GAS COOKER
BY A SWIRLING CENTRAL FLAME**

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The present study proposes a swirling central flame technique to improve the thermal efficiency of a conventional open-flame atmospheric gas cooker which is now widely used as a domestic appliance. More extensive studies were done in an effort to improve the thermal efficiency of the cooker by reducing thermal inertia of the pan support and using the proposed porous medium technology to recover heat from flame radiation to preheat the secondary air entrained from the bottom of the burner. The experimental results showed that the thermal efficiency of the swirling central flame burner with conventional support is approximately 15 per cent higher than that of the conventional radial flow burner. This can be attributed to the higher heat transfer coefficient between hot flue gas and vessel surface of the swirl burner than that of the conventional one. By replacing the conventional support of the developed swirl burner with a lighter one, whose mass was reduced by a factor of 3.7, the thermal efficiency could be increased by about 3 per cent. By using the proposed preheating secondary air support instead of the light support, the thermal efficiency could be further improved by 3 per cent. The predicted thermal efficiency obtained from the proposed model showed good agreement with the experiment.