

Performance Investigation of R32 and R410a Refrigerants with Different Compressor Lubricants



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Abstract The present study aims to investigate the effect of changing air conditioning refrigerants and compressor lubricants on system performance. Two types of refrigerants namely R410a and R32 paired with two different lubricants were investigated. A test rig consists of residential air conditioning with a thermal control room was developed in the present study. The initial refrigerant charge was varied to determine the optimum charge for each refrigerant-lubricant mixture. The results reveal that the optimum charge for R32 is 350 g that represents only 70% of the refrigerant amount for R410a. R32 performs better than R410a for both lubricants mixture. The R32-POE combination shows the best performance with 14% improvement from the baseline data. R32 performs better in the air conditioning originally design for R410 refrigerant and has a good prospect to replace R410a as a more environmentally friendly refrigerant.

Keywords Residential air conditioning · R32 refrigerant · R410a refrigerant · PVE lubricant · COP

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