



**MEASURED AIRTIGHTNESS OF  
TWENTY-FOUR DETACHED HOUSES  
OVER PERIODS OF UP TO THREE YEARS**

**PREPARED FOR:**

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## SUMMARY

The airtightness of 24 new houses was measured on a regular basis over periods of up to three years to evaluate the structures' air barrier systems and to study the possibility of air barrier degradation, as would be indicated by an increase in the measured leakage rate. Ten of the houses were built with the polyethylene air barrier system and 14 using an early version of the Airtight Drywall Approach (ADA). The 24 project houses were architecturally similar and of approximately equal size and general layout; stucco was the predominate wall finish.

The study found that the airtightness of the polyethylene air barrier houses remained stable over their respective monitoring periods. With regards to the critical issue of air barrier degradation, it was concluded that no evidence could be found to indicate polyethylene is unsuited for use as an air barrier material in residential construction. Although two of the 10 houses demonstrated possible, albeit slight, evidence of airtightness degradation, the magnitude of these changes was small and not judged to be of practical significance. All but one of the polyethylene houses met the airtightness requirements of the R-2000 program at the end of their monitoring periods. The project houses with the lowest measured leakage rates were those built with the double wall system and polyethylene air barriers.

The study also found that the airtightness of the 14 ADA houses remained stable during the monitoring period and it was concluded that no evidence could be found to indicate that the ADA system is unsuited for use in residential construction. Although six of the 14 houses displayed possible, but also slight, evidence of airtightness degradation, the magnitude of the changes was small and not of practical significance. All 14 houses met the airtightness requirements of the R-2000 Program at the end of their respective monitoring periods.

This study was conducted as part of the Flair Homes Energy Demo/CHBA Flair Mark XIV Project.

## RÉSUMÉ

On a mesuré l'étanchéité à l'air de 24 maisons neuves de façon régulière, sur des périodes allant jusqu'à trois ans, en vue d'évaluer les dispositifs d'étanchéité à l'air des constructions et d'étudier la possibilité de dégradation de ces dispositifs, qui serait indiquée par une augmentation du taux d'infiltrations et d'exfiltrations. Dix (10) des maisons avaient été étanchéisées à l'aide de polyéthylène, alors que les 14 autres utilisaient la méthode des murs secs étanches à l'air. Les 24 maisons du projet étaient d'une architecture semblable et avaient sensiblement les mêmes dimensions et le même aménagement général; le stuc était le fini principal des murs.

L'étude a révélé que les maisons étanchéisées à l'air à l'aide de polyéthylène avaient gardé une étanchéité stable au cours des périodes de contrôle. Pour ce qui est du problème critique de la dégradation du dispositif d'étanchéité à l'air, aucune preuve à l'effet que le polyéthylène ne convenait pas pour rendre étanches à l'air les constructions résidentielles n'a été révélée. Bien que deux des dix maisons aient présenté des signes, au demeurant faibles mais possibles, d'une dégradation de l'étanchéité à l'air, ces changements ont été jugés mineurs et sans importance d'un point de vue pratique. Toutes les maisons munies de polyéthylène, sauf une, ont satisfait aux exigences du Programme de la maison R-2000 à la fin des périodes de contrôle.

Cette étude a été réalisée dans le cadre du Projet de démonstration de la maison à haut rendement énergétique/Mark XIV de l'ACCH, de Flair Homes.

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