



DESCRIPTION:

The weight of intercity buses has increased by over 20% in the past 25 years. Recent surveys have shown that 18% of all busses exceed new regulatory restrictions.

In this project, Martec Limited worked very closely with Prévost Car Inc. to identify potential means of reducing the weight of Prévost intercity buses. This work is divided into 3 phases: developing conceptual designs for lightweight buses (Phase 1), manufacturing and testing prototypes of the concepts (Phase 2), and developing full-scale bus components for structural and in-service (road) testing (Phase 3).

Phase 1 is complete; Phase 2 is currently in progress. In this phase, the major structural components of the bus (roof, floor, and side truss) were identified as the areas to be studied for weight reduction concepts. The determination of lightweight design concepts for each of the selected bus structural components was performed through the analysis of a finite element (FE) model of a typical intercity bus.

State of the art manufacturing concepts and materials were investigated for their weight savings potential. Structural sandwich panels utilizing either lightweight metal skins or composite FRP skins made by pultrusion or resin infusion processes offer high strength to weight ratios. New forms of joining techniques such as structural adhesives and mechanical fastening techniques similar to the Alusuisse system for connection of aluminum extrusions were also investigated.

Reference:

1. Intercity Bus Weight Reduction Phase 1, January 2000, Martec Report: TR-01-04
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