Alpha Factor Determination from NAPTF Test Data

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Abstract

Full-scale test data for multiple-wheel heavy gear load operation on flexible airport pavements is summarized from three separate test series: one conducted by the U.S. Army Corps of Engineers (USACE), the MWHGL tests; and two conducted by the Federal Aviation Administration (FAA), the NAPTF tests. The MWHGL pavement structural configuration is used as a reference and all NAPTF structures are converted to equivalent reference structures by the use of thickness equivalency factors relating the NAPTF and the MWHGL structural materials. Traffic volume factors (alpha factors), required for the computation of pavement thickness by the CBR design procedure for flexible airport pavements, are calculated for the NAPTF test data and plotted in combination with the MWHGL alpha factors. Least squares quadratic curve fits are then computed for the four-wheel and six-wheel alpha factors and the alpha factors at 10,000 coverages computed for comparison with the International Civil Aviation Organization (ICAO) standard for computing Aircraft Classification Number (ACN). The results of the analysis are consistent with the existing alpha factor of 0.825 for four-wheel gears. But the results of the analysis are not consistent with the existing alpha factor of 0.788 for six-wheel gears. The six-wheel alpha factor at 10,000 coverages should be changed to a value approximately equal to the interim value of 0.72 adopted by the ICAO for calculation of ACN for six-wheel gears.

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