A computational procedure has been developed to correlate a full-scale room fire test process and results from the proposed International Organization for Standardization (ISO) small-scale laboratory tests. The analysis assumes that the combustible lining material covers ceiling and walls.

Derived material characteristics and test room time lag factors are used as input data to an uncomplicated mathematical expression, essentially describing the full-scale test fire process as a concurrent flame spread phenomenon. Undetermined parameters in the model have been derived using linear regression analysis and results from seven full-scale room tests. In these room tests, the tested materials were of such thickness that no burning through occurred.

Using results from the regression analysis, a simulation of the fire growth behavior can be carried out including the adjustments needed due to transportation time lags and instrument response time. The predictive capability was thought acceptable, but further experimental confirmation and sensivity studies are needed to assess the inherent variability.

Qualitatively the regression equation predicted the same relative ranking of materials as the room test.For thin surface finish materials on a noncombustible base, it was possible to derive a radiacally simple expression to be used as indication of the risk of flashover.

Again, the final usefulness only can be evaluated on the basis of further experimental evidence.

In summary, it is thought that a first step has been taken in the efforts to use results from small-scale tests to rationally predict full-scale fire growth (for one specified scenario) and rank materials.