

SOME OBSERVATIONS CONCERNING THE VALIDITY OF IIC MEASUREMENTS FOR A FLOATING FLOOR IN A JUDO PRACTISE HALL

Richard Patching, M.Eng., P.Eng.
 Patching Associates Acoustical Engineering Ltd.
 #105, 6815 - 8th Street NE, Calgary T2E 7H7
 Phone (403) 274-5882 Fax (403) 295-0732
 E-mail: Patching@Internode.net

In a judo practise hall, or *dojo*, the practise area of the floor is covered by mats called *tatami*. This traditional kind of Japanese floor covering prevents injury when the players are forcibly thrown to the floor in the course of the practice of this martial art. However, in modern buildings the original floor is typically a concrete slab rather than the traditional wooden structure, and so a false floor is often installed between the *tatami* and the concrete floor.

The false-floor structure was based on an earlier design used for a high degree of noise isolation for marine tugboats. The original floor used SCE-41 closed cell neoprene foam strips 2" (50 mm) wide and 1" (25 mm) thick, laid out in a grid 2 foot by 2 foot (0.6 m X 0.6 m), overlain with two layers of 3/8" plywood, glued and screwed. The resilience of the foam strips are rated as 2 to 5 psi, and are referred to as 3 psi.

There was very little data available, so the final design was optimized for the impact loading typical in this sport, through field experimentation. The calculated resilience (spring constant) for the final design was approx. 1.6×10^6 N/m, calculated using the nominal resilience of the foam. The layout of the final design of the sub-floor is shown in Figure 1.

After the floor had been in place for over a year, IIC measurements were taken of 1) the original floor, 2) the false floor, 3) the finished *tatami* surface, and 4) the *tatami* surface with a wooden plate (a table turned upside down) on top of it. A standard ASTM tapping machine was used for all of these tests, but the tests used only one source location and so are not strictly in compliance with the ASTM standard (E1007-90).

Table 1 shows the field IIC (FIIC) ratings.

IIC Ratings of Layers of <i>Dojo</i> Floor	
Layer Tested	FIIC Rating
1. Bare Concrete Floor	41
2. On Sub-floor	45
3. On <i>Tatami</i>	57
4. On Table on <i>tatami</i>	45

Although condition 4 spreads the impact loading out over a greater area, the noise levels in the dojo increased substantially. The test may be more indicative of the airborne noise isolation than of the impact actually transmitted to and through the floor.

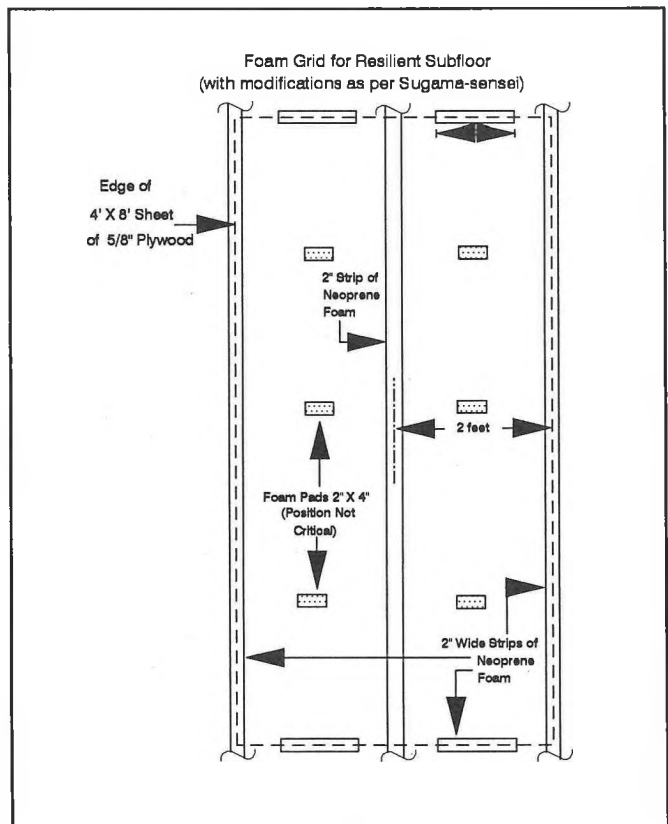


Figure 1