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THE FACTS ABOUT SPRUNG FLOORS FOR DANCE



Sprung floor manufactured by Harlequin at Schweizerische Ballettberufsschule, Zurich.

The development of dance floor technology has progressed significantly in recent years, thanks in no small degree to a strong relationship forged between the dance community and industry to produce floors that are right for dancers. There has also been medical science research that has provided valuable insight into injuries to which dancers are prone.

Understanding the relationship between dancers and dance floors has provided important input to dance floor technologists. Research is meanwhile continuing that additionally seeks to understand the contribution to artistic performance that a well-designed floor can offer dancers.

Two important factors that contribute to a floor that allows dancers to perform confidently and safely are the dance surface and the sprung sub-floor beneath. Expecting anyone to dance on a hard, unyielding surface can lead to a variety of ankle and shin stress related injuries that may also reduce a dancer's career in the longer term.

Medical specialists in dance injuries have established a link between the quality of the floor and injury. A floor with a consistent degree of spring is strongly recommended. The second factor is the dance surface itself which should offer a degree of 'traction' that allows dancers to be able to fully and artistically express their dance movements without the fear of slipping or falling due to a shiny or slippery surface.

THE EVOLUTION OF SPRUNG FLOORS

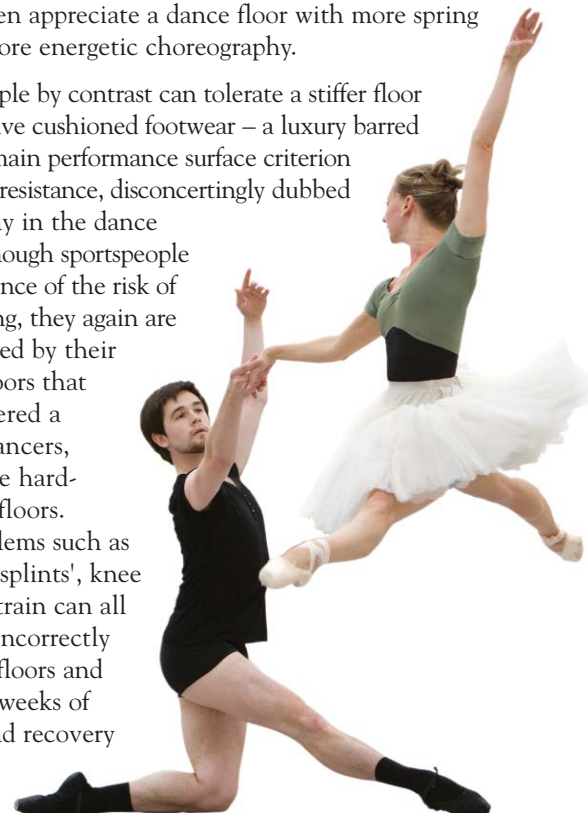
Historically the choice of performance surface was between a wooden floor and linoleum, until the advent of purpose developed vinyl floors during the 1970s. The desire for a floor with 'give' was accelerated by the fashion in ballroom dancing before and after World War II. These floors often used coil or leaf springs and, as genuinely sprung floors were far too bouncy for ballet or contemporary artistic dance the need to provide semi-sprung floors – particularly for ballet – led to considerable modifications. In the last 50 years metal springs have largely given way to resilient blocks or pads made of rubbers or polymers. With modern floor construction methods, the trampoline effect of the early sprung floors has been suppressed.

WHY DANCE FLOOR CHARACTERISTICS ARE DIFFERENT FROM SPORTS AND OTHER FLOORS

It is a common assumption that a well-designed sports floor will suit the needs of dancers. But there are two intrinsic differences – the construction of the sprung sub-floor and the performance surface. Along with some shock absorption, most indoor sports require a high degree of energy return and a requirement for adequate ball bounce. Evidently, dancers have scant interest in ball bounce, but they are vitally focused in a different way on a combination of shock absorption and energy return that a sprung sub-floor can provide.

There are no hard and fast rules, but it is clear that female dancers tend towards shock absorption – without any sponginess – whereas the men appreciate a dance floor with more spring for their often more energetic choreography.

Indoor sports people by contrast can tolerate a stiffer floor as they usually have cushioned footwear – a luxury barred to dancers. The main performance surface criterion for dancers is slip-resistance, disconcertingly dubbed 'traction' by many in the dance community. Although sportspeople share the abhorrence of the risk of slipping and falling, they again are generally protected by their footwear from floors that might be considered a slip hazard for dancers, for example some hard-lacquered wood floors. Lower limb problems such as tendonitis, 'shin splints', knee pain and ankle strain can all be attributed to incorrectly specified sprung floors and can take several weeks of physiotherapy and recovery time to correct.



A BRIEF LOOK AT SOME RECENT AND CURRENT RESEARCH CONCERNING DANCE FLOORS

Independent research has examined how sprung dance floors can help dancers reduce risks of injury and also provides new insight into performance related benefits.

Dance scientist and biomechanics expert Luke Hopper's research investigated the effects of dance floors on dancer performance and injury. Various floors used by professional dancers in the UK were tested and it was found that only the floors specifically made for dance complied with the standards for hardness. Therefore requiring dancers to perform on floors that are not dance specific may present an unnecessary injury risk. Luke Hopper is lecturer of exercise and clinical biomechanics at the University of Notre Dame, Fremantle and is now investigating dancers' perceptions of varied dance floor surfaces and the relationship between various floor mechanical properties and perceptions of floor injury risk and performance qualities.

Surgeon Boni Rietveld, MD Head of The Dutch Medical Centre for Dancers and Musicians, The Hague, Co-Founder of The Dutch Performing Arts Medicine Association states: "It is as dangerous to dance on a hard floor as it is to constantly dance on different types of floor. The best preventative method will always be the installation of a correct dance floor. In my opinion, a dance floor should be neither too supple nor too soft. A hard floor has the effect of causing serious return shock waves and can bring about injuries or premature wear in the cartilage." Starting in September 2010, Dr Boni Rietveld will commence a research project with the Conservatoire de Paris and Harlequin Europe SA to compare traditional basket weave floors with a Harlequin sprung floor panel system.

James Hackney PT, PhD, Sara Brummel MFA, Kara Jungblut SPT and Carissa Knoderer SPT. Physical Therapy Department of Missouri State University investigated the effect of sprung (suspended) floor on leg stiffness and vertical ground reaction force during grand jeté landings in ballet. For eleven out of the thirteen dancers who participated, the leg stiffness was increased in landing grand jeté on the sprung floor. In each of the dancers who showed this effect, the total leg compression (joint flexion) was less on the sprung floor than on the energy-returning floor. This implies a lower requirement on the dancer's landing leg in absorbing the force of landing, and by extension, supports the notion that a sprung floor may be helpful in reducing the rate of musculotendonous injury associated with the task that we studied.

SPRUNG FLOOR CONSTRUCTION

There are three main types of sprung dance floor that vary in how the sprung sub-floor is constructed.

- Basket weave construction sprung floor.
- Fully floating sprung floor composite construction.
- Sprung panel construction.

Each of these is completed with a vinyl dance surface, selected from a range of options to suit the principle dance styles for the particular facility.



Installation at Laban



Basket weave at the Scottish Ballet

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Cellular polyurethane layer



First layer of semi-flexible panels



Top semi-flexible panel layer with joints staggered



Harlequin vinyl performance surface

A White Paper – The Facts about Sprung Floors for Dance – can be downloaded at www.harlequinfloors.com