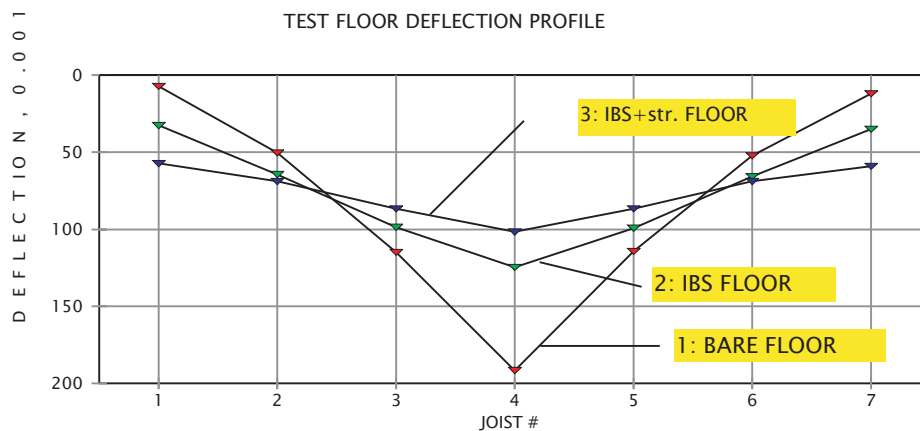


## How does IBS improve a Floor?

Adding IBS to any floor increases the floor stiffness resulting in reduction of the leading causes of floor performance complaints. IBS Product Attributes: Less Bounce, Less Vibration, Less Acceleration, Higher Frequency, Better Damping, Reliable Attachment

### Less Bounce

The addition of IBS engages more joists under footstep load resulting in up to 50% less deflection compared to the same floor without IBS. IBS also limits the deflection differential between adjoining joists to 15% compared to 45% for the same floor without IBS. This is illustrated in the test floor deflection profile below where seven joists floor were loaded at the centre with a 225 lb. (1 kN) static point load that mimics the impact of footstep load.



**Line 1** depicts the deflection profile for the bare floor (floor without IBS). Three central joists are doing most of the work and the floor caves in at the point of footstep resulting in a large deflection.

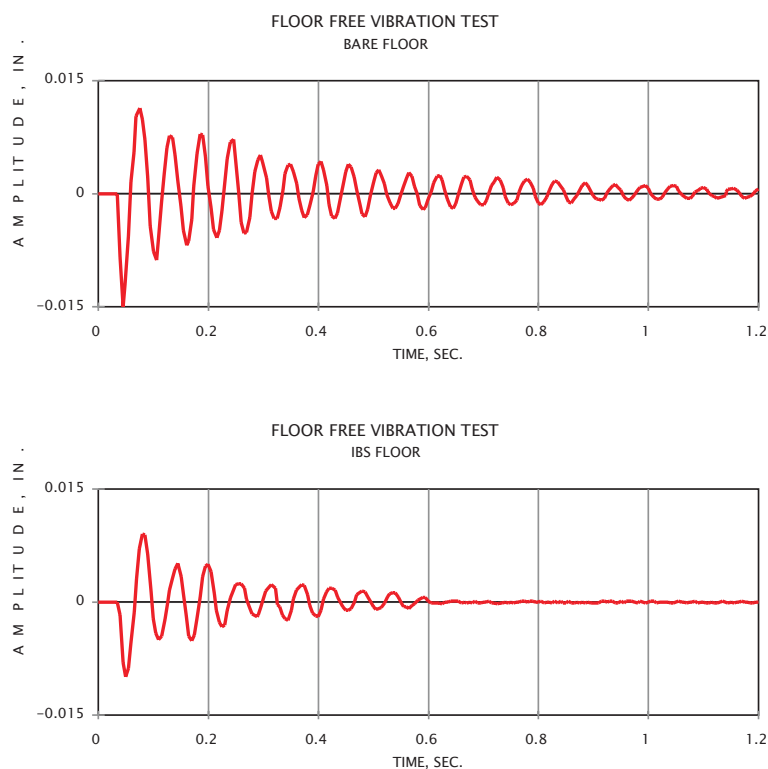
**Line 2** depicts the deflection profile for the floor with one row of IBS without strapping. More joists are engaged reducing deflection to 65% of that of the bare floor.

**Line 3** depicts the deflection profile for the floor with one row of IBS with strapping or ceiling. More joists are further engaged reducing deflection by 50% of that of the bare floor.

## Less Vibration

Amplitude and duration of vibration is another annoying result of footstep load on under-performing floors. IBS increases floor stiffness to better redistribute footstep energy in a floor. IBS also acts as a shock absorber as the IBS units are forced to bend elastically when the floor oscillates thus dampening the floor. Bending the IBS units takes a substantial part of the impact energy, reducing vibration amplitude and duration bringing the floor to rest in 50% of the time taken by the same floor without IBS.

This is illustrated in a typical test floor free vibration trace (illustrated below) where a seven joist floor was let to oscillate after being pulled down at the centre and then released to vibrate freely. The test was performed on the same floor with and without IBS. The non-IBS floor vibrated with higher amplitude and for twice as long compared to the IBS floor, due to its excellent damping properties.



## Less Acceleration

IBS's capacity to reduce the rate of movement of the floor under footstep loading is a major contributor to improved floor acceptability. Unlike standard floors, which cave in quickly in an uncomfortable jerking motion, floors with IBS respond in a controlled manner with the engagement of additional joists reducing the downward and upward motion of the floor.

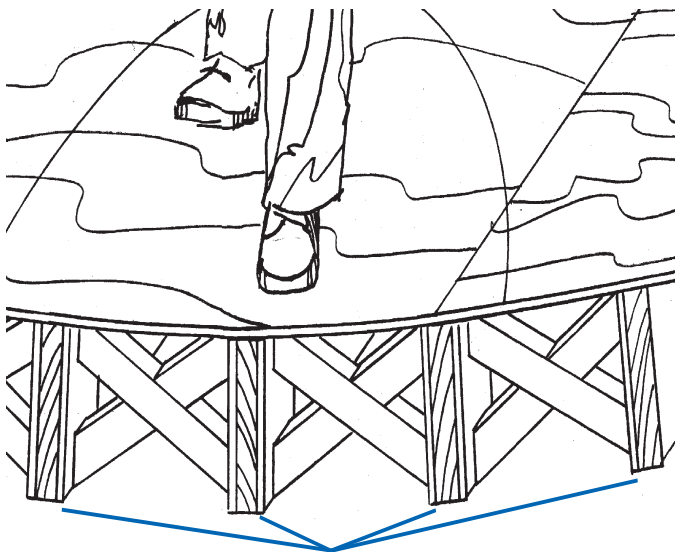
## Higher Frequency

Floor tests have demonstrated that IBS increases the floor frequency up to 15%. Higher frequency is commonly acknowledged as a factor that improves floor acceptability.

## Reliable Attachment

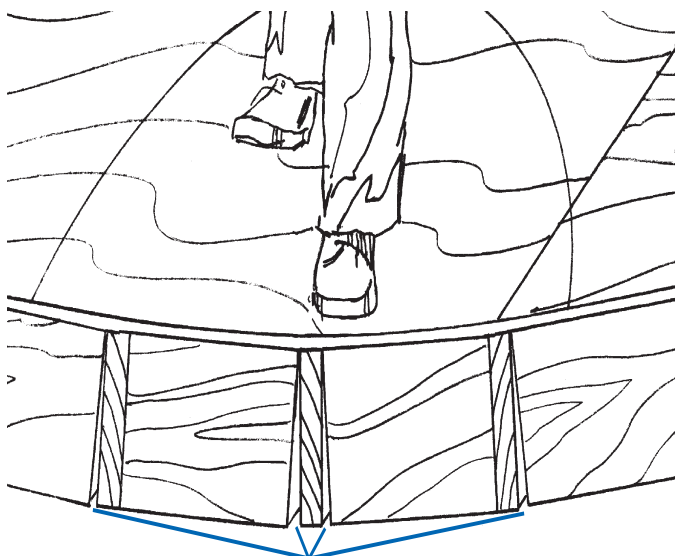
The IBS attachment to the I-joist flange has been tested to 1.2 million cycles without any loss in connection stiffness.

## Product Flexibility Compared



Cross Deforms → Connections Hold

The IBS unit mirrors the deformation of the floor cavity under footstep load by conforming to the changing shape of the joist cavity. This is achieved by the deformation of IBS members, not by degrading the connection to the joists. For this reason IBS has never been the cause of squeaks in a floor system. This deformation uses load energy and helps to increase floor damping.



Blocking Undeformed → Connections Fail

Blocking, being rigid, cannot mirror the deformation of the floor cavity under footstep load and therefore cannot conform to the changing shape of the joist cavity. For this reason, blocking cannot adjust to the change in floor cavity resulting in the degradation of the blocking to joist connection, which is, the cause of squeaks. This failure dramatically reduces blocking's load sharing capacity and connection durability.