Photo: Waagner Biro Stage Systems

Seating wagons on air bearings in store in the Waterfront Hall in Belfast.

In practice, however, a stage floor might be boarded, with small gaps between individual boards, probably also with traps and covers, with gaps, to the fixed floor. Also, it is common that a wagon has to pass over the 10 mm (0.4") gap between adjacent elevators and fixed flooring, which may also have up to a 10 mm height difference. All of these conditions provide air-leakage paths, which vary throughout the travel of a wagon from one position to another.

To overcome these variations it is necessary to provide excess blower capacity. This ensures that there is always adequate air pressure to lift the load, and adequate flow to provide the lubrication layer. There is a relationship between air pressure and volume of air supplied from a blower. If flow volume is low, pressure is closer to maximum. If flow is high the pressure will be lower. Also, because of the shape of the performance curve, there is a point where a relatively small increase in flow rate, due to increased leakage, will produce a much more significant fall in pressure and load-bearing capacity.

Unfortunately, the provision of excess capacity can lead to another problem. If there is a wide range in the quality of the floors over which a wagon is operated and the blowers are selected to work on the worst surface, vibration of the units can be caused when on the good surfaces. This is usually when stationary. It is caused by the membrane forming a much better seal with the floor, the pressure rising in the pocket and raising the wagon, then the seal breaking down so that the wagon falls. This is repeated at a frequency dependent upon the load, the blower capacity, and the floor surface.

This condition is most commonly met when a stage or auditorium floor is boarded with narrow, ill-fitting boards, and the storage area floor is power floated concrete, sealed and painted.

It would be possible to engineer some form of variable control for the blower, allowing the operator to modify performance to suit the floor surface, but this would be at extra cost and complexity. The practical and most cost-effective solution is to ensure that the stage or auditorium floor is well made and finished, with the numbers of traps and clearance gaps kept to a minimum. It should be noted that the satisfactory performance of an air-bearing system is dependent not only on the wagon design, but also on the floors over which it is to operate. A well-made and well-sealed floor has cost bene
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The many ways of removing, changing and storing seating are described, along with some statistics relating to multi-use of spaces, the background to the use of air-bearings and some highly-mechanised adaptable venues. In contrast, the many different forms in which the Cottesloe Theatre has been set up manually are examined.

There are two forms of air bearing which are available commercially: low pressure and high pressure. The low-pressure system operates at pressures of between 1 and 2 psi (0.07–0.14 bar) and a typical unit would have a footprint of approximately 60 cms x 60 cms (2'-0" x 2'-0") and a lifting capacity of 300 kg (660 lbs). Low-pressure systems tend to have individual air blower units, or perhaps one blower feeding two bearings.

High-pressure systems operate at pressures of 10–15 psi (0.7–1 bar) or greater, and can therefore lift heavier loads. These systems usually have an external compressor or blower unit, with air being supplied to the wagon through a large diameter hose. **Ω**

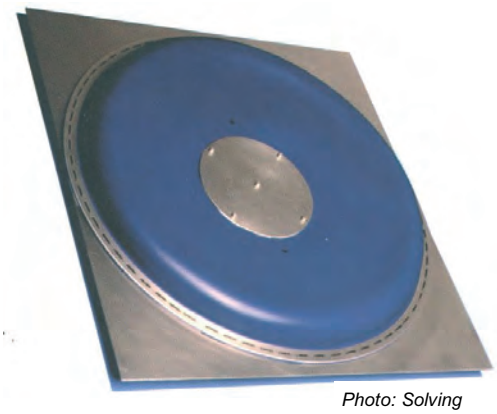

Photo: Solving

High pressure air bearing as manufactured by Ab Solving Oy, Finland and used in major industrial installations.