

Vibration Control,
Mounting and Levelling of:

PRINTING PRESSES



Printing Presses

Printing Presses come in various types but can be divided into 2 basic types;

Single and multiple colour print Unit Presses tend to be installed directly onto concrete floors which have been suitably designed to be capable of supporting the static and dynamic forces produced by the press. For such machines Farrat machine mounts are an ideal way of providing stiffness, vibration damping and easy installation with precise levelling.

Large multi print unit presses for newsprint and magazine printing are large, complex and expensive pieces of capital equipment where a number of factors need to be considered when planning the installation and operation;

- They operate at high speeds to accommodate high production volumes
- They have to achieve a high level of precision in the print output

Design Consideration 01:

Vibration affecting operating performance or surrounding buildings and equipment

Like all high speed rotating machines a certain level of disturbing vibration is to be expected. Printing presses are complex structures made up of numerous internal rotating parts each of which could produce out of balance forces. The press structure and the surrounding building structure containing the press will have many different structural natural frequencies and if any of these coincide with aforementioned rotating frequencies then problems can occur due to structural resonances which in extreme cases can make the press or the building unusable.

With this in mind it is critical to avoid any low frequency resonance effects between the press and the surrounding floor, building structures, and subsoil.

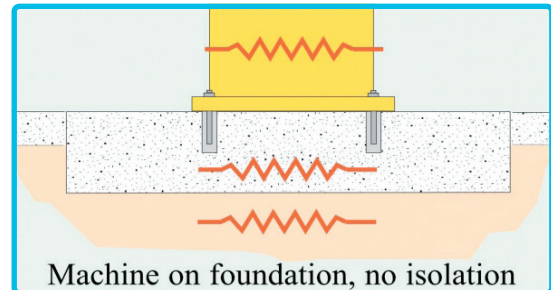
- The likely operating frequencies can be ascertained either from the press manufacturer and the end user or by measurement on a similar installed machine
- The natural frequency response of the surrounding floor, building structures, and subsoil may be estimated by a structural engineer using finite element analysis

With regard to installation considerations for large multi print unit presses for newsprint and magazine printing it is important to note that they are usually;

- Very tall machines comprising of base and upper decks supported by concrete pillars. The reel stands are installed on the base whilst the print units are on the upper deck
- Modular, so alignment between each module is critical

When considering these factors, even if vibration isolation is not required, it is usually the case that the entire machine needs to be installed on a single, specially designed concrete foundation of suitable strength and stiffness.

Farrat can assist the design team throughout the planning and installation process so please feel free to contact us to discuss your project requirements right from the start.



Solution 1.1

Isomat Isolated Foundation Systems

If vibration isolation does need to be incorporated into the design then an Isomat Isolated foundation system designed to isolate the lowest operating frequency of the press has proved to be an ideal solution.

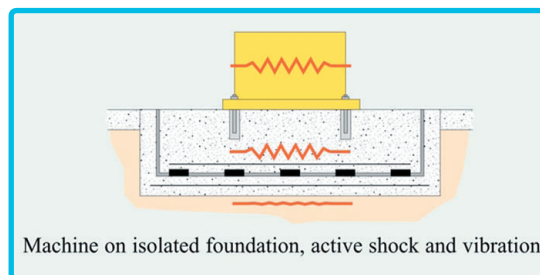
Advantages

- An Isolated Foundation is generally the most effective way of protecting high value machines and their operating performance from shock and vibration. Systems can be designed to isolate;
 - **Active Isolation** (vibration created by the Press operation affecting surrounding structures)
 - **Passive isolation** (externally induced vibrations affecting press operation. Maximum levels at different frequencies which the press can accept tend to be provided by the manufacturer)
- Effective isolation of vertical disturbing frequencies above 12Hz
- Effective isolation of horizontal disturbing frequencies above 4Hz
- Can be designed to avoid resonance with any disturbing frequencies
- An ideal blend of vibration isolation and damping
- Often used as a precautionary measure in case of unexpected shocks and future facility alterations
- Isomat has a proven track record in a very wide range of industrial applications since 1977
- An economical solution
- Simplified foundation design
- Easy to install
- Long performance lifetime
- Maintenance free

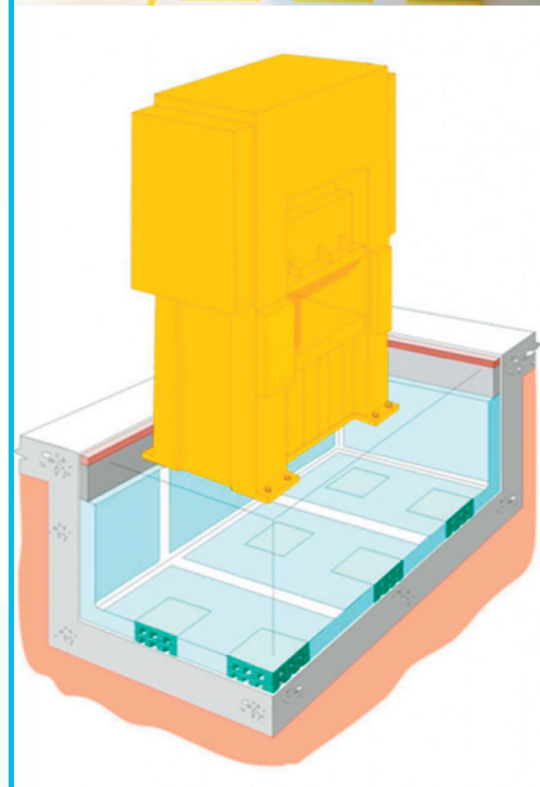
Disadvantages

- Limited effectiveness (apart from damping) in isolation of disturbing frequencies below 12Hz

Suggested Farrat Isolator System: Isomat IMBR50-50



Machine on isolated foundation, active shock and vibration



Solution 1.2

Lateral Vibration Isolation (LVI) with Farrat Isofoam

An Isofoam LVI Laterally Isolated Foundation is created by lining the perimeter walls of a foundation with Farrat Isofoam high performance perimeter isolation material. Different stiffness grades are required depending on depth of foundation assuming the block is to be cast as one single pour.

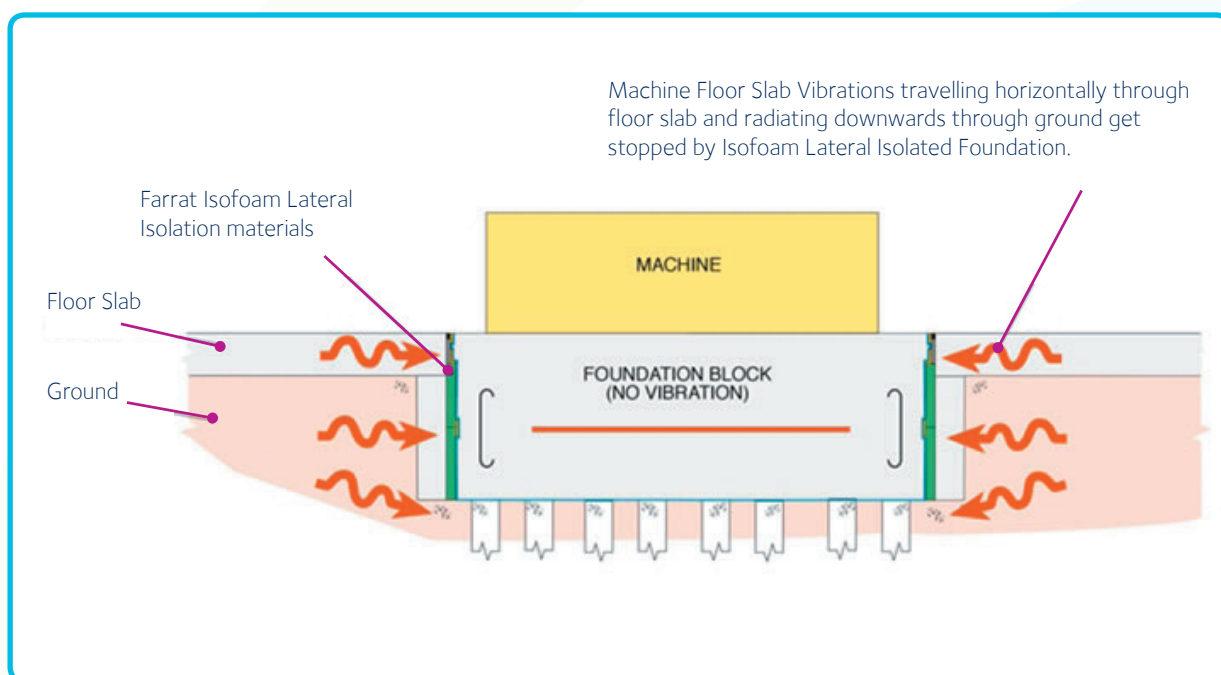


Advantages

- Required where full base isolation system is not feasible due to cost and or foundation stiffness requirements
- Effective attenuation of lateral floor borne disturbing vibration
- An economical solution
- Simplified foundation design
- Easy to install
- Long performance lifetime
- Maintenance free

Disadvantages

- Limited effectiveness against vertical disturbing vibration



Design Consideration 02:

Installation, fixing and levelling

Large printing presses tend to be modular so levelling and alignment between each module as well as connection between the machine and the floor or foundation is critical to successful operation.

Farrat Machine Mounts are used to:

- Provide easy and accurate installation and levelling
- Ensure the machine has a stable and uniform support to maximise machine accuracy and performance and to reduce the risk of degradation from machine bed misalignments, internal stresses and flex
- Overcome irregularities in floor slabs or foundations
- Increase vibration damping of the machine
- Provide layout flexibility

When selecting which Farrat machine mount is appropriate one of the first questions is whether the machine needs to be installed 'freestanding' or does it need to be bolted down?

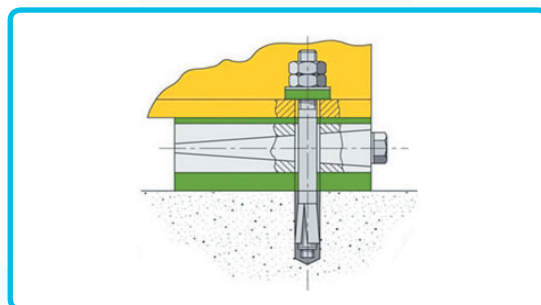
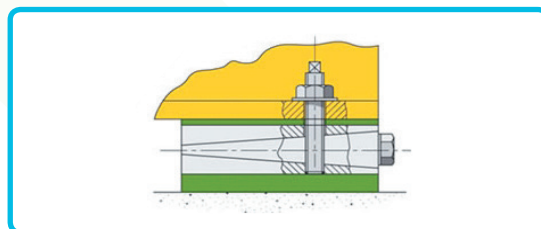
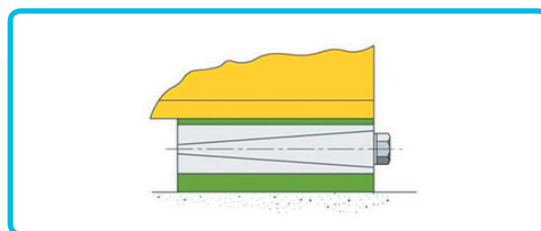
Freestanding FS: Placing and levelling the machine on freestanding machine mounts is the preferred installation method for most applications

Bolt-On BO: Bolting the machine to the mount but not the floor is usually used for machines with horizontal inertia forces such as: injection moulding machines, diecasters and horizontal forges

Bolt Through BT: Bolting down is usually required for;

- Top heavy machines
- Certain long bed machines
- Machines with high inertia forces.
- Machine connection to an isolated or specialist foundation. A rigid connection to a foundation inertia block takes full advantage of the mass damping effect of a machine plus foundation.

It should be noted that unless levelling elements such as Farrat Wedge Levelling Elements or Levalators are used there is a risk that bolting the machine down could cause distortions in the machine bed which may affect its performance.



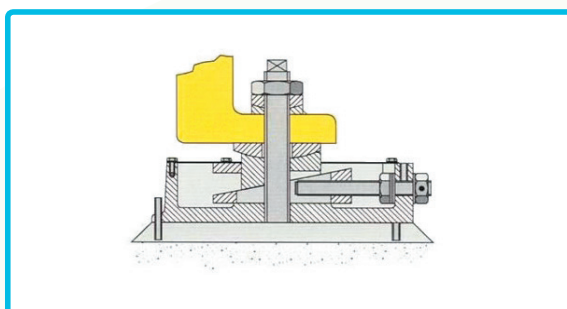
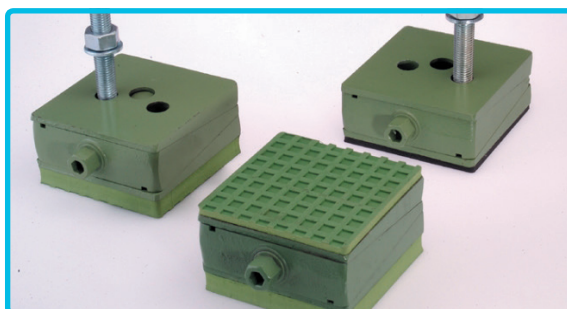
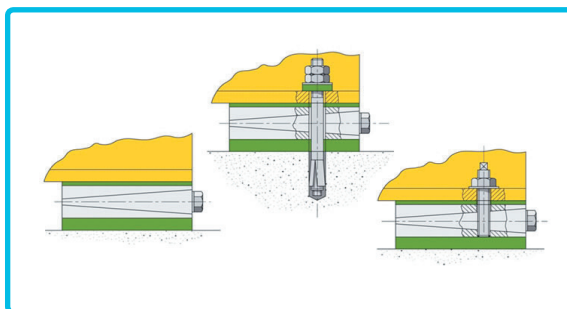
Solution 2.1

Wedgemounts

Farrat Wedgemounts are an ideal solution for all printing press sizes and installation scenarios because they provide;

- Accurate, efficient and economical machine installations
- Precision vertical levelling adjustment with no horizontal forces applied when adjusting
- High ratio of lifting force to adjustment torque to ensure accurate and smooth levelling
- Enhanced machine stability (the machine is not sitting on the screw thread)
- Vibration Damping (in some variants)
- Allow factory layout flexibility through easy installation and relocation

For printing presses Farrat recommends either WLF (Freestanding), WLB (Bolt on), WLT (Bolt Through) types with standard or stiff damping pad grades. We are happy to discuss exact requirements and specifications to find the ideal match.

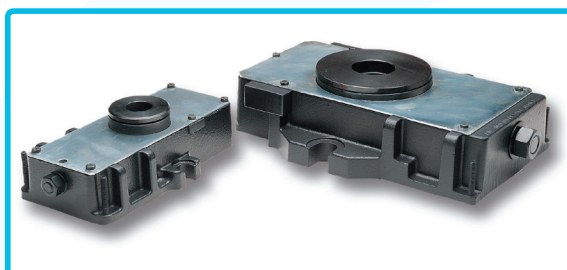
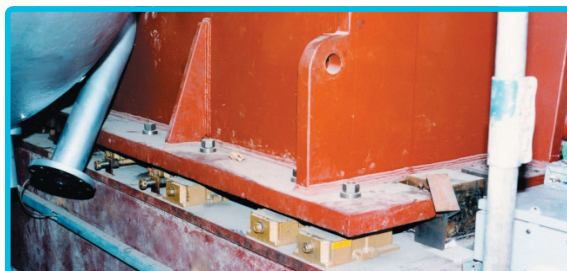


Solution 2.2

Levalators

Levalators provide the highest level of equipment support and stiffness for total machine to foundation integration maximising the vibration damping and bed reinforcing effect of the foundation. They improve performance by increasing alignment accuracy, rigidity and stability with the following features;

- Low overall height to ensure a low machine centre of gravity
- The fixing bolt passes through the centre line of the mount allowing high bolt tensions through the centre of the mount without bed distortions
- Accurate precision alignment with micro-meter type height adjustment range of 12mm
- Spherical seating corrects misalignment and complex angles between machine and foundation
- High vertical stiffness to prevent machine bed deflections occurring under dynamic load distributions
- Large contact support area with foundation surface



- Systemised, predictable and economical installation procedures to simplify machine installations including pre-grouted prior to equipment installation
- Offering the facility to re-align machines with minimum production loss

Solution 2.3

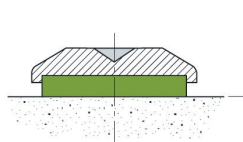
Jackmounts

Smaller printing presses can be installed on Farrat Jackmounts which offer a simple secure and economical means of supporting and installing machinery suited to jackscrew support. They should not be used under machines with strong vertical or horizontal shock forces.

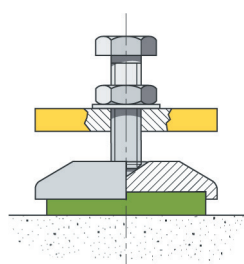
Advantages of using Jackmounts:

- Enables excellent, stable seating on uneven floors
- High vibration damping to improve machine performance, reduce machine wear and lower noise levels
- Reduce shock transmission to and from the machine
- Protect floors and surroundings from the harmful effects of vibration
- High friction grip so machines don't move
- No bolting down or grouting for fast and economical installation and relocation

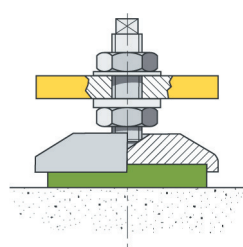
For printing presses Farrat recommends either FS (Freestanding) or BO (Bolt on) types with either stiff or very stiff damping grades. We are happy to discuss exact requirements and specifications to find the ideal match.



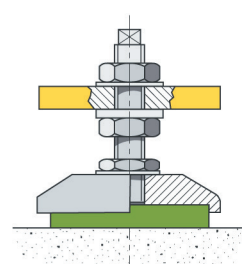
FS - Freestanding



FS - Freestanding



FS + SA - Free Standing
+ Optional screw
Assembly



BO + SA - Bolt On -
+ Optional Screw
Assembly



Global experts in
**Vibration Control, Thermal Isolation &
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for Construction, Industry & Power Generation

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