Machinery, in general as designed and manufactured, results in uneven weight distribution as far as the footprint of the machine itself is concerned. (see Fig. 1)

Some machines may also have heavy horizontally moving parts and, as a result of this, the weight distribution varies as the machine operates.

Conventional vibration isolators are of “constant stiffness” i.e., the force vs. deflection curve is a straight line. It was proven both analytically and by numerous installations of vibration sensitive objects that if stiffness of each isolating mount is not proportional to the weight load on this mount, then intense vertical floor vibrations are transformed into intense horizontal vibrations of the object (machine), thus degrading the vibration isolation and requiring more expensive isolation mounts. This problem can be eliminated if vibration isolators are used, which have the characteristic that the stiffness increases proportionally with the load. Such vibration isolators are called the CONSTANT NATURAL FREQUENCY isolators.

The designation of CNF type mounts is derived from the fact that the natural frequency of a system, by definition, is proportional to the square root of the ratio of its stiffness to its mass. Mass m is equal to weight W divided by acceleration of gravity g, or m=w/g. Thus, while use of conventional constant stiffness isolating mounts requires determining position of the center of gravity, complex calculations and use of different mounts for the same machine, the isolation quality can be rather poor. CNF mounts can be used without any calculations for a wide range of loads. Thus they are called UNILOAD.

\[
    f = \frac{1}{2\pi} \sqrt{\frac{k}{m}}
\]

Where k is the stiffness of the flexible element (constant stiffness) and m is the mass of the load.
A Brief Description of Constant Natural Frequency Mounts

Fig. 5 shows Load to Natural Frequency characteristics of two (brown for range 400-1000 lbs., black for range 700-1900 lbs.) mounts which qualify to be used as CNF type mounts. The graph on Fig. 5 shows the relationship between natural frequency and the weight of the load. These graphs have been derived from actual tests of the mounts by obtaining load vs. deflection measurements and subjecting these values to subsequent calculations. All mounts have the same natural frequency and can be used interchangeably.

The graph on Fig. 6 represents the characteristics of the large mount which can bear loads up to 8000 lbs.

As previously indicated for conventional isolators, the user must determine the position of the Center of Gravity, calculate weight distribution between the mounting points of the machine, use different isolators whose stiffness is proportional to weight on each mount. All these actions are time consuming, messy (it is easy to misplace mounts), and inaccurate, especially when a heavy component (e.g., table) is moving inside the machine. CNF isolators are identical (cannot be misplaced) and do not require any calculations, and can be used in all places within their specified range. It was proven that the performance of CNF mounts is superior to conventional; i.e., constant stiffness, type isolators.

For additional technical information please consult July 2006 issue of "Sound and Vibration" magazine which contains an article written by Prof. Eugene I. Rivin of Wayne State University, Detroit, Michigan.

The AAC part numbers for these CNF mounts are:

<table>
<thead>
<tr>
<th>Type</th>
<th>Inch Size of the Leveling Bolt</th>
<th>Metric Size of the Leveling Bolt</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Black Range 700-1900 lbs. (317.5 - 861.8 kgf)</td>
<td>—</td>
<td>V10Z24M10040HDA</td>
</tr>
<tr>
<td>Small Brown Range 400-1000 lbs. (181.4 - 453.6 kgf)</td>
<td>—</td>
<td>V10Z24M10040LDA</td>
</tr>
<tr>
<td>Large Black Range 2000-8000 lbs. (907.2 - 3629 kgf)</td>
<td>V10Z24 - 575175A</td>
<td>V10Z24M14545A</td>
</tr>
</tbody>
</table>

For additional technical information go to: http://www.vibrationmounts.com/NewProducts/vibrationisolation.pdf
**Advantages:**
- Leveling mount
- Stiffness of mount increases with applied load
- Most durable and corrosion-resistant
- Adjustable up to 13 mm (1/2") in height. For larger adjustments, use the spacer plates shown on page 3-8.

**Applications:**
- Lathes
- Printing Machines
- Grinding Machines

---

### Catalog Numbers

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>Hardness Durometer</th>
<th>Color</th>
<th>Max. Load kgf (lb.)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Impact</td>
</tr>
<tr>
<td>V10Z24M10040LDA</td>
<td>40</td>
<td>Brown</td>
<td>1614 (400)</td>
</tr>
<tr>
<td>V10Z24M10040HDA</td>
<td>60</td>
<td>Black</td>
<td>317.5 (700)</td>
</tr>
</tbody>
</table>
**MATERIAL:** Housing – Carbon Steel, Zinc Plated
Isolator – Nitrile Rubber

- FOR LOADS UP TO 8000 POUNDS (3629 kgf)

**FEATURES:**
- Leveling mount
- Stiffness is proportional to load
- Most durable and corrosion-resistant
- Adjustable up to 1/2” (13) in height.
  For larger adjustments, use the spacer plates shown on page 3-8.

**APPLICATIONS:**
- GRINDING MACHINES
- LATHES
- MILLING MACHINES
- PRINTING MACHINES
- PRINTING PRESSES

**CATALOG NUMBER | COLOR | MAX. LOAD LB. (KGF)**
--- | --- | ---
V10Z24-575175A | Black | Impact: 5000 (2268) | Steady: 8000 (3629)

**NOTE:** Dimensions in ( ) are mm.
**UNILOAD® Constant Natural Frequency Mounts**

**MATERIAL:**
- Housing – Carbon Steel, Zinc Plated
- Isolator – Nitrile Rubber

**FOR LOADS UP TO 3629 kgf (8000 lb.)**

**FEATURES:**
- Leveling mount
- Stiffness is proportional to load
- Most durable and corrosion-resistant
- Adjustable up to 13 (1/2") in height. For larger adjustments, use the spacer plates shown on page 3-8.

**APPLICATIONS:**
- GRINDING MACHINES
- LATHES
- MILLING MACHINES
- PRINTING MACHINES
- PRINTING PRESSES

**Catalog Number** | **Color** | **Max. Load kgf (lb.)**
--- | --- | ---
**Impact** | **Steady**
V10Z24M14545A | Black | 2268 (5000) | 3629 (8000)
• **MATERIAL:** Spacer Plate – Sheared Hot Rolled Low Carbon Steel

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**NOTE:** Dimensions in ( ) are mm

**Height adjustment without spacer plate**

**Height adjustment with spacer plate**

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**NOTE:** Spacer plates may be required under certain floor conditions.

<table>
<thead>
<tr>
<th>Catalog Number</th>
<th>A ± 1/8 (3.2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>V10Z24-PLATE-5</td>
<td>5 (127)</td>
</tr>
<tr>
<td>V10Z24-PLATE-7</td>
<td>7 (178)</td>
</tr>
</tbody>
</table>