

# UNISORB®

INSTALLATION TECHNOLOGIES

## Quantum PM™ Press Mount

APPLICATION & SPECIFICATION GUIDELINES



ISO-9001 Certified

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# INTRODUCTION & TABLE OF CONTENTS

## INTRODUCTION

This UNISORB® *Quantum PM™* **Press Mount** publication presents detailed product information covering this superb line of products. These mounts are part of our Engineered Products line of mounting equipment, and are specifically designed for each press application. It is our intent to completely familiarize you with UNISORB® *Quantum PM™* **PressMounts** while providing technical information supporting our claim to the unequalled quality represented by this line of products.

UNISORB® *Quantum PM™* **Press Mounts** have been carefully developed to provide optimum performance, even in the toughest applications, along with unparalleled ease of installation.

The UNISORB® engineering staff and field representatives are always ready to provide design and on-site assistance with your machinery installations to assure maximum product performance.

Contact UNISORB® Engineering and Sales at 888-4-UNISORB or FAX (517) 764-5607.

UNISORB® is a registered trade name of UNISORB® Installation Technologies. Other registered trade names and trademarks in this catalog include:

*Quantum PM™* **Press Mounts**  
Vector™ Anchor Bolts  
V-1® Non-Shrink Machinery Grout  
V-100® Epoxy Grout  
Red-Line Anchor™ Pads  
Titan™ Shock Pads

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## UNISORB® SPECIALIZED ENGINEERING

Established in 1935, UNISORB® has become the nation's leader in the manufacturing of premium quality machinery installation systems.

Unique in its breadth and depth of line, UNISORB®'s anchoring, leveling, aligning, vibration isolation and noise control devices, systems and accessories will solve almost any equipment installation problem.

*UNISORB® has the only engineering staff devoted exclusively to the design and implementation of complete machinery installation systems. These engineering services are typically provided free of charge.*

The requirements of each installation are carefully studied to determine the proper combination of devices needed for the system, and a formal engineered proposal presented.

From concept to final installation of a system, UNISORB® can assure optimum performance of mounted equipment with the industry's most experienced staff of designers, application engineers, and field engineers.

In addition, factory trained field representatives are available during installation and system start-up to assure that maximum performance is attained.

# PRESS MOUNTING CONSIDERATIONS

All too often presses are installed by simply setting them in place on the shop floor with no consideration for proper installation. Special foundations are sometimes used to provide adequate support, especially with larger tonnage presses. When used without proper support, a multitude of problems can occur, from unwanted vibrations to premature wear of press components to die failure, etc. Due to the excessive shock and vibration caused by the operation of the press, isolation material such as felt, rubber and composite have sometimes been placed under the press feet, and shims used for leveling (see figure 1).

This is a step in the right direction, but does not address the problem of fast, easy, accurate leveling and alignment of the presses, nor of maintaining alignment. For this reason the press mount was developed to provide both ease of leveling and alignment, as well as vibration isolation (see figure 2).

This development has provided cost savings for metalworking operations everywhere. The performance of a

press is greatly affected by how it is installed. The performance of other equipment, as well as personnel, are also influenced by how presses are installed. Presses should be supported in such a manner that the shock and vibration generated in normal operation does not transmit into surrounding areas, thereby disrupting precision machining work and/or contributing to personnel fatigue.

*Press mounts have provided a way to allow presses to perform at optimum levels, while reducing the cost of installation, operation and maintenance. Other cost savings include fewer scrap parts and less building damage to floors, foundations, etc.*

In order to perform to design specifications, presses must be supported adequately to maintain alignment and critical relationships between press and feed equipment.

The support system for a press must be capable of dealing with:

1. Static loads (dead weight of the press)
2. Stamping impacts and snap-through forces
3. Slide inertia forces
4. Rotating out-of-balance forces

To determine whether or not a press is a good candidate for the use of press mounts, let's briefly examine each of the four items listed above.

**1. Static loads** are the forces seen at each mounting point with the press in operating position, but completely at rest. Most presses have four mounting points, but are constructed so that the weight is not evenly distributed among them. Usually the rear feet are farther from the center line of the slide travel than the front feet. Also, flywheels and drive equipment on mechanical presses are located on one side or another. This uneven distribution of weight must be taken into account when designing any support system. UNISORB® *Quantum PM™* Press Mounts make it possible to compensate for unequal weight distribution by allowing adjustment of load-

**2. Stamping impact and snap-through forces** are present to some degree in all presses and can be particularly troublesome when higher speed machines are used for blanking. The rapid rate of rise of force as the stock is contacted by the punch moves the press crown upward and the bed downward, stretching the press uprights in the process. At maximum capacity, the uprights of a press could be stretched to their allowable limits. When the work material fractures, the opposite action occurs with the press crown moving downward and the bed upward to its original position, and because of this inertia, slightly beyond. This reaction is called snap-through shock. These forces are magnified by any misalignment condition which exists within the press. Both the stamping impact and snap-through forces can be greatly reduced by proper leveling of the press, thus assuring proper alignment of press components. Press mounts are very useful for controlling these forces and assuring symmetrical loading of the press structure, thus greatly enhancing component life.

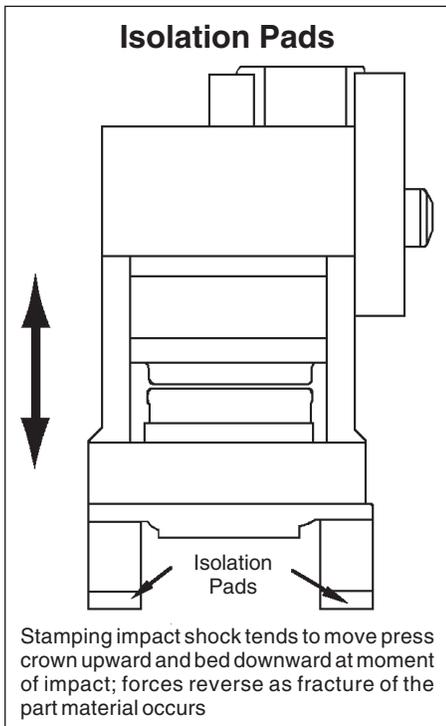


Figure 1

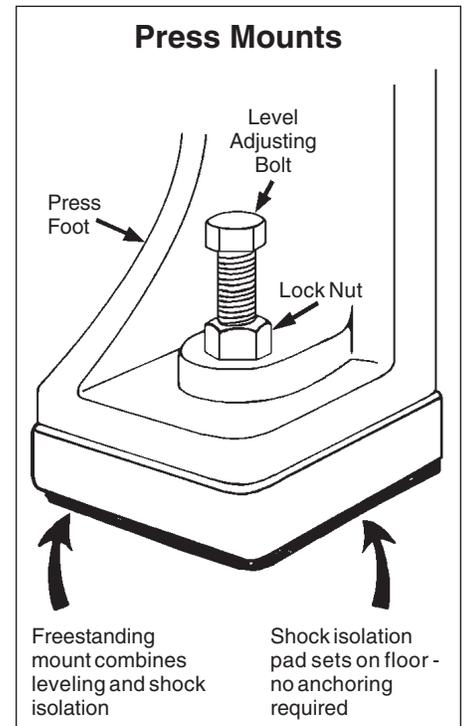


Figure 2

## PRESS MOUNTING CONSIDERATIONS

(continued)

**3. Slide inertia forces** result from acceleration forces acting on the slide and are an extremely important consideration in the design of a press mounting system. They act primarily in the direction of slide travel and tend to alternately lift the press from its supporting surface and push it back into its supporting surface. In some high speed presses it is possible for these forces to exceed the dead weight of the press. This condition establishes a limitation as to whether or not a press should be mounted on freestanding mounts. Machines which are manufactured with dynamic balancing equipment do not have this problem, and can safely be mounted on press mounts. Older high speed presses should be securely bolted down, and are good candidates for isolated foundations (see figure 3).

**4. Rotating out-of-balance forces** result from crankshaft imbalance and produce a rocking of the press about its mounting points. This problem is usually found in older presses which do not have dynamic balancing equipment, and which are being operated at high speeds. In cases like this, proper action must be taken to restrain the press. When this condition exists on a press it is possible to predict by calculation the amplitude of the rocking motion that will occur if sufficient engineering data can be obtained on the press. Otherwise, a stiffer than normal installation must be furnished to minimize the rocking motion. This condition also is well suited to the isolated foundation approach.

Anytime a press cannot be mounted safely on press mounts due to any of the above conditions, UNISORB® offers the perfect solution. UNISORB® Inertia Block materials, used in conjunction with a well engineered foundation with proper anchoring, will reduce the vibration and impact problems associated with the operation of these machines, while maintaining the rigidity needed for proper support. In some

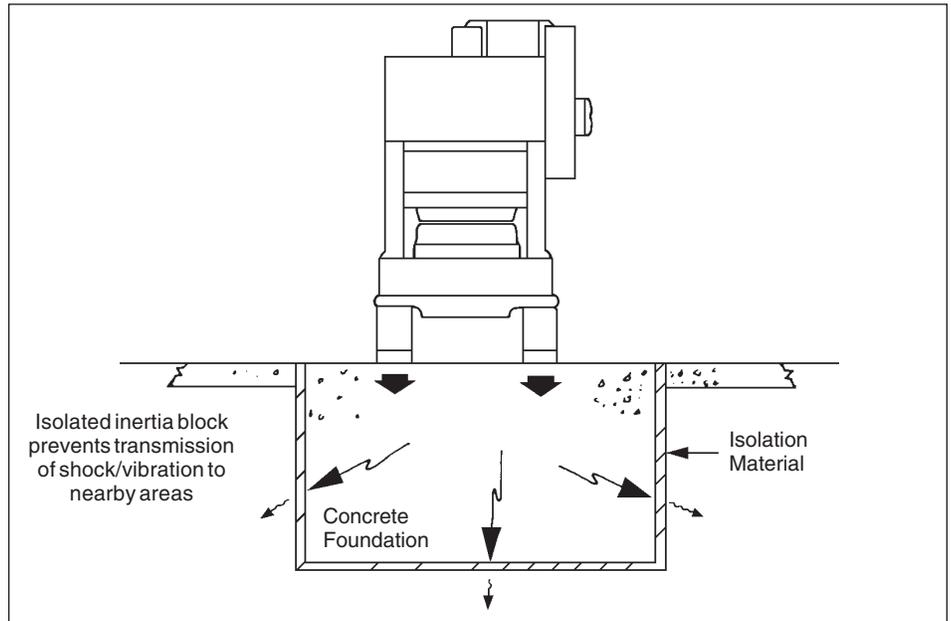


Figure 3

cases presses have been mounted using both press mounts and inertia blocks, thus providing ease of leveling while further tuning out vibration problems. Contact UNISORB® Engineering for more information about the inertia block isolation materials.

In lieu of constructing an isolated foundation, UNISORB® isolation pads can be placed under the press feet, and the press securely bolted to the floor, with leveling accomplished by the use of shims. UNISORB® Vector™ Anchor Bolts, together with either UNISORB® V-1® Non-Shrink Machinery Grout (cement-based) or V-100® Epoxy Grout, can be used to anchor the press feet to the floor. Contact UNISORB® Engineering for more information on these fine products.

By utilizing press mounts whenever possible, anchor bolts, steel plates, shims and grouting materials can be eliminated, thus saving time and money. Any savings in labor and down time can be considered to be significant financial gain. These savings also can be

realized any time a press is relocated. Other savings which can be attributed to the use of press mounts are related to reduced maintenance of presses, dies, foundations and floors.

Two very important design considerations should be taken into account when press mount evaluations and selections are made:

### A. Press mount construction

### B. Isolation pad material selection

**A. Press Mount Construction** is critically important because of the tremendous pounding inflicted upon the mount during press operation. UNISORB® has optimized the balance between the high quality and strength of ductile cast iron and structural steel for its housing construction. The ductile cast iron is used on the smaller mounts, while the larger mounts utilize the structural steel components. The ductile cast iron offers the best combination of strength and economy for our

# PRESS MOUNTING CONSIDERATIONS

(continued)

smaller Press Mounts (PM-61 thru PM-201).

Due to the necessity for flexibility of size and shape, the PM-261 models and larger are manufactured using structural steel. All the UNISORB® *Quantum PM™ Press Mount* components are rugged enough to suit any press application. UNISORB® has the option of using structural steel for any of its press mount sizes if the need for special size or shape mounts arise. UNISORB® *Quantum PM™ Press Mounts* have also maintained the popular design feature of the spherical dimple in the impact plate under the adjusting bolt to allow for angular correction for uneven floors. For the above reasons UNISORB® has maintained its position as the most versatile supplier of press mounts in the industry.

**B. Isolation pad material selection** is paramount because it determines the degree of proper vibration isolation and environmental conformity which may be achieved by using press mounts. The design and construction of UNISORB® *Quantum PM™ Press Mounts* provides the capability of choosing from a variety of isolation pad designs. These products are selected on the basis of their individual characteristics to meet your exact isolation needs. This flexibility provides the opportunity to maximize vibration isolation and take into account shape factors, environmental conditions, spring rates, etc. Therefore UNISORB® is not restricted to the use of any one type of pad material. UNISORB® elastomeric pads are molded to exacting specifications to achieve optimum shock, damping and vibration control. UNISORB® Titan™ Shock Pads provide excellent vibration control and damping, especially under extreme loads and high shock applications. A combination of Elastomeric Pads together with Titan

Shock Pad inserts offer the perfect solution to solving the vibration/isolation problems on larger presses (see Figure 5). UNISORB® Elastomeric Pads are impervious to fluid absorption and provide excellent isolation and damping. The high quality molded compound is superior to industrial neoprenes in oil resistance and damping. Urethanes and other elastomers are also available, if needed, to meet the special requirements of the Food and Drug Administration and the U.S. Department of Agriculture.

UNISORB® *Quantum PM™ Press*

**Mounts** have a special "Friction Kote" available on the bottom surface of the resilient pads to prevent presses from "walking" on shop floors.

Finally, as "the proof of the pudding is in the eating," so "the value of a press mount is in the performance." UNISORB® *Quantum PM™ Press Mounts* outperform others in reducing shock and vibration. Please see pages 8 and 9 of this manual for vibration curves illustrating this.

UNISORB® has many satisfied press mount customers, and a list of referrals is available on request.

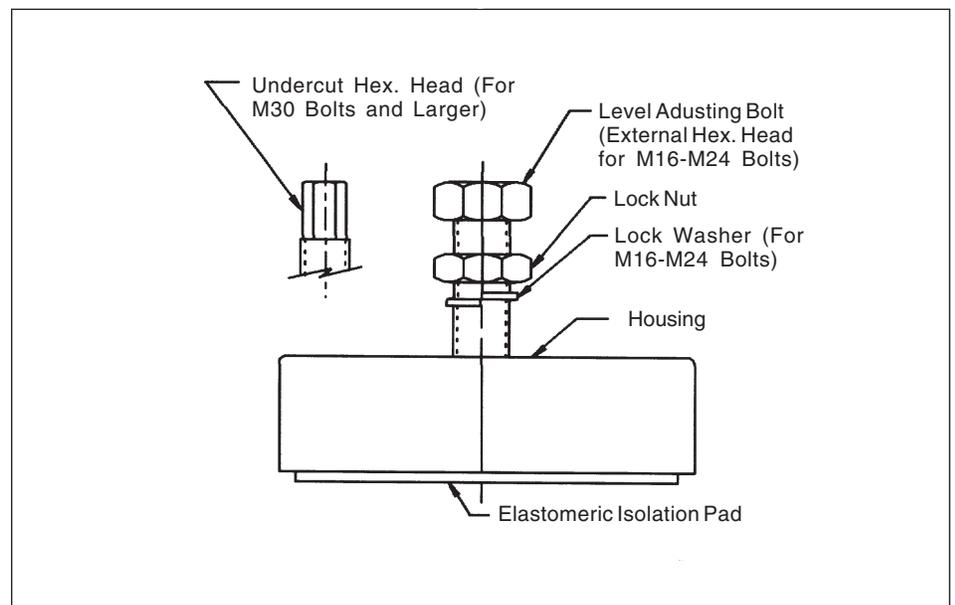


Figure 4

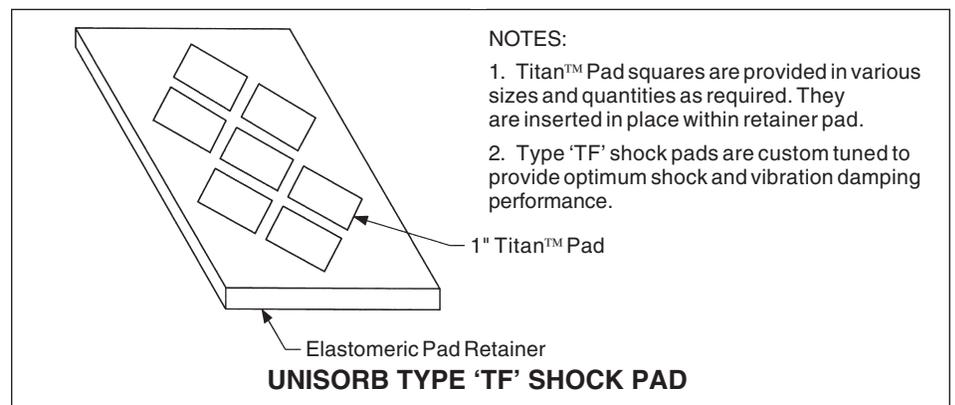
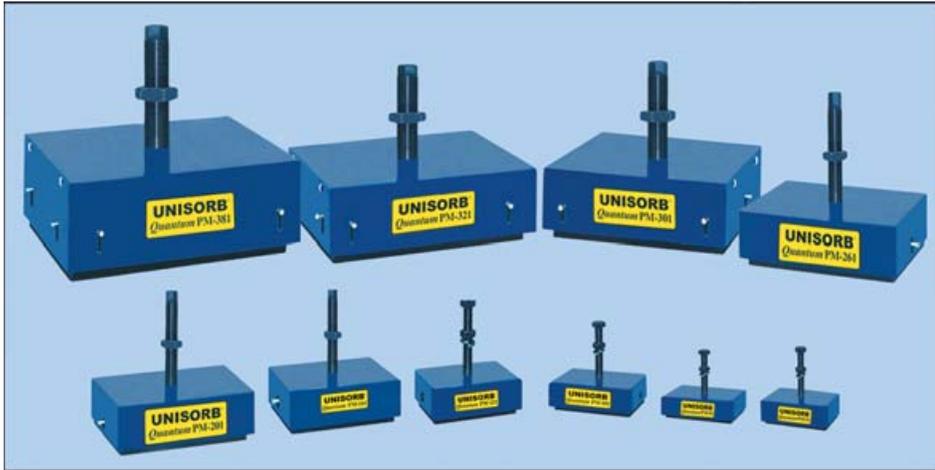
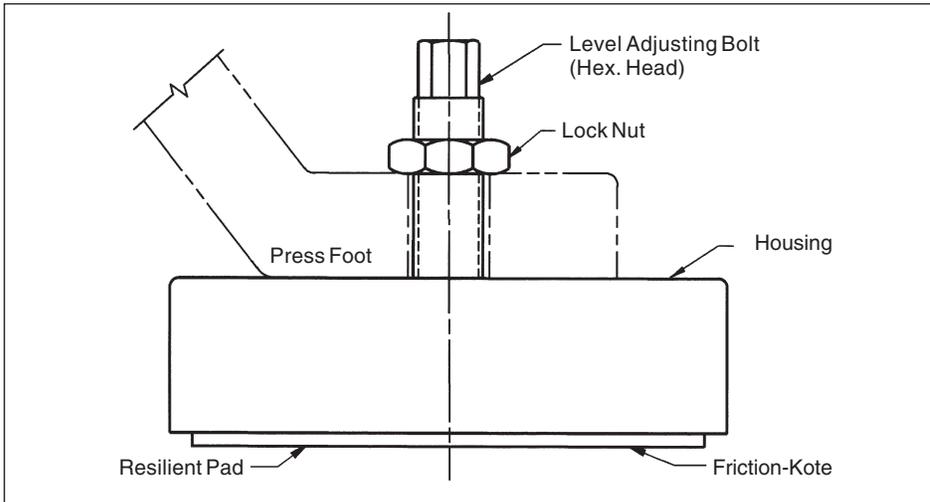


Figure 5

# UNISORB® Quantum PM™ Press Mounts FOR HEAVY DUTY PRESSES



UNISORB STANDARD PRESS MOUNT FAMILY



## SPECIFICATIONS

PRESS MOUNT SERIES	LENGTH	WIDTH	HEIGHT* (min*)	BOLT SIZES AVAILABLE
PM-61	7.00	4.50	2.50	M16 thru M24
PM-81	8.00	5.88	2.50	M20 thru M30
PM-101	10.00	7.88	3.25	M20 thru M36
PM-121	12.50	9.00	3.50	M24 thru M42
PM-161	16.00	12.50	4.50	M30 thru M56
PM-201	20.00	16.00	6.00	M42 thru M80
PM-261	26.00	22.00	7.50	M64 thru M100
PM-301	30.00	24.00	9.50	M80 thru M110
PM-321	32.00	24.00	10.50	M80 thru M130
PM-351	35.00	20.00	11.00	M80 thru M130
PM-381	38.00	25.50	13.00	M100 thru M150
PM-421	42.00	24.00	14.75	M100 thru M150
PM-481	48.00	36.00	15.50	M130 thru M180

All dimensions in inches, unless otherwise specified. \*Top of mount housing to floor.

Over 150 standard individual mount configurations are available to fit your exact needs. Special mounts are also available.

Proper press installation is critical to achieving optimum performance.

UNISORB® Quantum PM™ Press Mounts offer the following benefits:

- Increased press life
- Increased tooling life
- Simplified press installation
- Fast, accurate alignment
- Reduced shock and vibration
- Elimination of anchor bolts
- Reduced need for special foundations
- Reduced operator fatigue
- Reduced motor loads
- Uneven floors accommodated
- Press “walking” prevented

UNISORB® Quantum PM™ Press Mounts are considered engineered products, and as such are custom applied by UNISORB® engineers to meet the specific requirements of each press application. The unit consists of four main components:

1. Rugged housing design
2. Heavy duty steel impact plate
3. High strength steel adjusting bolt
4. High quality resilient isolation pad

A variety of isolation pad materials and configurations are available to meet the requirements of almost any press application. These pad options include:

- UNISORB® Titan™ pad for high impact loading and shock
- Type ‘TF’ Pads for “fine-tuning” mounts for larger, heavier presses
- Specially engineered and formulated elastomeric pads

Ten standard sizes are available (see specification chart). Special sizes and configurations are also available as required. Contact UNISORB® Engineering Department for design assistance.

# UNISORB® Quantum PM™ Press Mounts

## INSTALLATION PROCEDURES

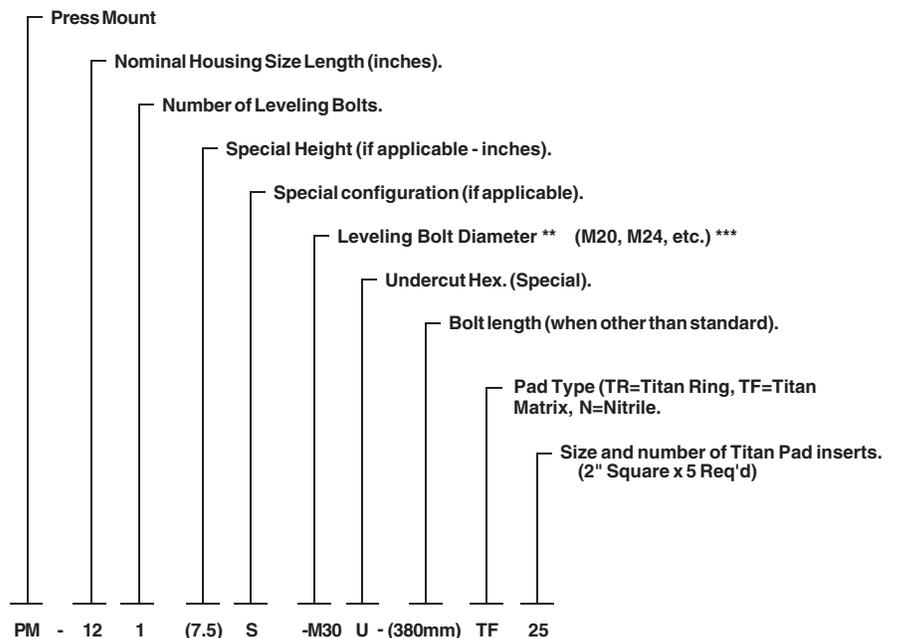
1. Clean floor, removing all oil, grease and debris.
2. Bring press into location and raise it sufficiently to allow mounts to be positioned under the mounting feet.
3. Remove the leveling bolts from mounts. Keep each leveling bolt and mount together as a set so the stamped number on the housing and the bolt head match.
4. Position mounts (with bolt holes aligned with holes in press feet) and insert leveling bolts through bolt holes in press feet and screw into bolt holes in mounts.
5. On the PM-61 and PM-81 series only, adjust each mount with the leveling bolt so the pad extends below the mount housing approximately 1/4". (All other mounts will automatically be positioned similarly.)
6. Lower press onto mounts so all mounts accept uniform loading.
7. After 20 minutes (allowing the press to "settle in") locate the mount housing closest to the floor and elevate it to 1/4" off the floor. Level the press by adjusting the other mounts using the first mount as the point of reference. On large presses it may be necessary to assist lifting the press by external means while adjusting leveling bolts. On the PM-81 series mounts the maximum amount of pad showing below housing should not exceed 5/8".
8. The torques on the leveling bolts should be relatively equal, signaling even load distribution.
9. Add flat washers if necessary to adequately cover holes in press feet. A lock washer may also be added if desired.
10. Tighten nuts, thus securing press feet to mounts.



ADJUSTING PRESS MOUNT

## PRESS MOUNT MODEL NAME LEGEND

Press Mount Model PM-121(7.5)-M30 (380mm)-TR



\* If press foot requires (2) leveling bolts, contact UNISORB Engineering for application assistance.

\*\* Verify that clearance hole is suitable for leveling bolt.

\*\*\* For step-down leveling bolts, show diameter of upper portion of bolt first, then lower portion, (i. e., M20/M36).

# UNISORB® Quantum PM™ Press Mount CALCULATION CRITERIA

PLEASE FILL OUT THIS PAGE AND FAX TO UNISORB @ 1-517-764-5607  
THIS DESIGN SERVICE IS FREE. COMPLETE CONTACT INFORMATION IS REQUIRED TO RECEIVE YOUR QUOTE.

CUSTOMER NAME: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

PHONE: \_\_\_\_\_ FAX: \_\_\_\_\_ E-MAIL: \_\_\_\_\_

CUSTOMER CONTACT NAME: \_\_\_\_\_

## PRESS CHARACTERISTICS:

PRESS MAKE: \_\_\_\_\_ MODEL: \_\_\_\_\_

PRESS TYPE: OBI  OBS  S.S.  OTHER: \_\_\_\_\_

PRESS CAPACITY (TONS): \_\_\_\_\_ PRESS WEIGHT: \_\_\_\_\_

PRESS SERIAL NUMBER: \_\_\_\_\_ MAX DIE WEIGHT: \_\_\_\_\_

PRESS FUNCTION: BLANKING  DRAWING  EMBOSSING  OTHER: \_\_\_\_\_

BED SIZE: \_\_\_\_\_ PRESS HEIGHT: \_\_\_\_\_

FOOT THICKNESS: \_\_\_\_\_ MAX. TOP WASHER DIA. \_\_\_\_\_

STROKE LENGTH: \_\_\_\_\_ STROKES PER MINUTE: \_\_\_\_\_

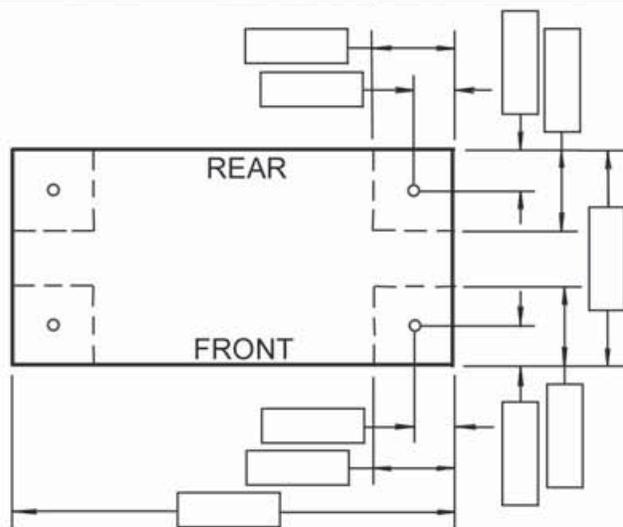
WEIGHT DISTRIBUTION: BALANCED  UNBALANCED  DESCRIBE: \_\_\_\_\_

MECHANICAL  HYDRAULIC  PNEUMATIC  OTHER: \_\_\_\_\_

BOLT LENGTH RESTRICTIONS ABOVE FEET? YES/NO DESCRIBE: \_\_\_\_\_

OBSTRUCTION BELOW BOTTOM OF PRESS FEET? YES/NO DESCRIBE: \_\_\_\_\_

## PRESS FEET DIMENSIONS (PLEASE COMPLETE)



BOLT HOLE SIZE:

- ACTUAL  
 ESTIMATED

IF PIT IS PRESENT OR REQUIRED,  
PLEASE SEND DRAWINGS.

PLEASE QUOTE:

- PRESS MOUNTS  
 ANCHOR BOLTS  
 ISOLATION PADS  
 GROUT  
 ISOLATED FOUNDATION

PLEASE COPY THIS PAGE, FILL OUT THE INFORMATION  
AND FAX OR MAIL TO UNISORB FOR FREE PRESS MOUNT  
DESIGN SERVICE.



INSTALLATION TECHNOLOGIES

**www.unisorb.com**

BOX 1000, JACKSON, MI 49204-1000

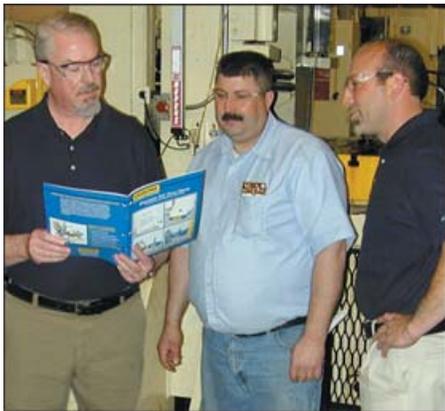
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ISO-9001:2000 Certified

## VIBRATION SURVEY SERVICES AND “SMART MOUNT” TECHNOLOGY

### VIBRATION SURVEY SERVICES

UNISORB® provides vibration analysis service as part of its overall engineering assistance program to meet every customer’s machinery installation need. Our engineers are thoroughly trained in the use of state-of-the-art vibration analyzing equipment and are experienced in analysis of technical data collected for virtually all machinery shock and vibration installation prob-



CUSTOMER SUPPORT BY UNISORB PERSONNEL

lem. Solving difficult machinery installation problems by providing comprehensive engineered solutions is our primary mission.

UNISORB® engineers have performed vibration surveys in the field for many years and have identified the dominant frequency ranges typically found in shop and plant environments. This information has guided UNISORB® in the engineering and development of its Press Mounts in providing the proper isolation from these troublesome frequencies. The floor/soil system response to externally generated vibrations influences the effectiveness of any isolation system and must be included in a complete analysis.

Ambient vibrations are detected by using highly sensitive seismic accelerometers. These devices are capable of measuring the entire frequency spectrum, including the typically troublesome low frequencies and low amplitude movements which may affect performance of precision machinery.

Vibratory signals processed in FFT analyzers are capable of looking at time domains and frequency components of all signals. By knowing the exact ambient conditions, an efficient isolation system can be developed.

Contact the UNISORB® Engineering Department for further information on our Vibration Survey Services.



PROCESSING VIBRATION INFORMATION

### UNISORB® “SMART MOUNT” TECHNOLOGY PROVIDES A GREATLY IMPROVED APPROACH TO OPTIMIZING PRESS PERFORMANCE

UNISORB® expertise in performing field evaluations and analyzing vibration signatures from all types of rotating and reciprocating equipment has led to the development of Advanced Dynamic Analysis Techniques for determining actual press operating conditions and proper mount adjustment. By comparing vibration spectra from individual press mounts it is possible to assure that the resolution of dynamic forces generated during operation are symmetrically resolved by the mounting system. This important breakthrough in analytical techniques has provided an excellent tool to provide an even better environment for the press being installed.

Relatively simple and easily learned analysis techniques (often

using equipment already owned by the user) provide an “up and running” look at the forces seen by each mount including how these forces are being resolved. This technique is more cost effective and accurate than “steady state” or static load analysis in assuring optimal mount usage.

Special mount modifications or “single purpose” analysis equipment are not required as the collection of data simply requires the application of a vibration transducer to an exterior mount surface. The mounts do not require any modification whatsoever although transducer mounting locations for permanent transducer attachment can be provided by the factory for applications where mount accessibility is limited.

“Smart Mount” analysis also provides a means of monitoring ongoing changes in the press or its mounting system for the future. Once base line data has been established for a given press, subsequent “check ups” are easily performed (without downtime) to verify operating conditions or detect potential problems.

Contact your UNISORB® representative or call our Engineering Department to learn more about this and other aspects of our state-of-the-art approaches to maximizing your return on machinery investment.

**FOR MORE INFORMATION  
CALL 888-4-UNISORB**

## TEST RESULTS

# UNISORB® MAKES

UNISORB® *Quantum PM™* Press Mounts have a proven track record of successful press installation, the results of which have been documented by vibration surveys.

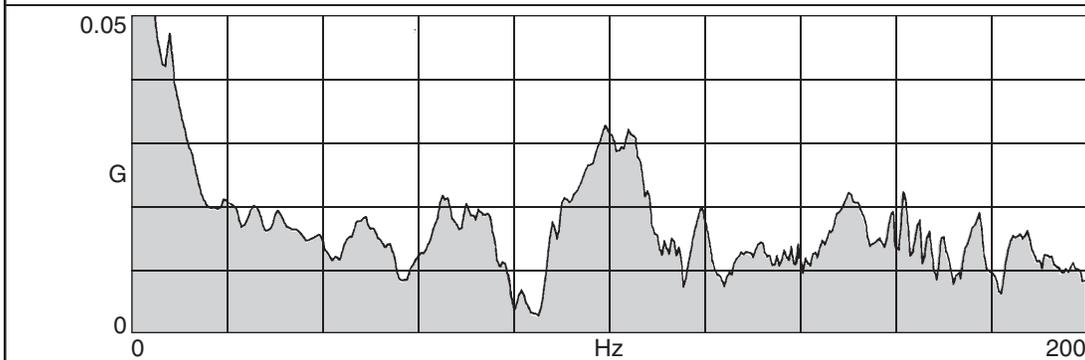
The overall vibrations (measured on the floor compared to the press foot) are virtually eliminated when mounted on UNISORB® *Quantum PM™* Press Mounts. By comparison, the reduction seen on competitors' multilayer composition pads can be as low as 7%. The actual differences were 7%, 41%, 33% and 42% for an average reduction of 31% on the competitors' pad.



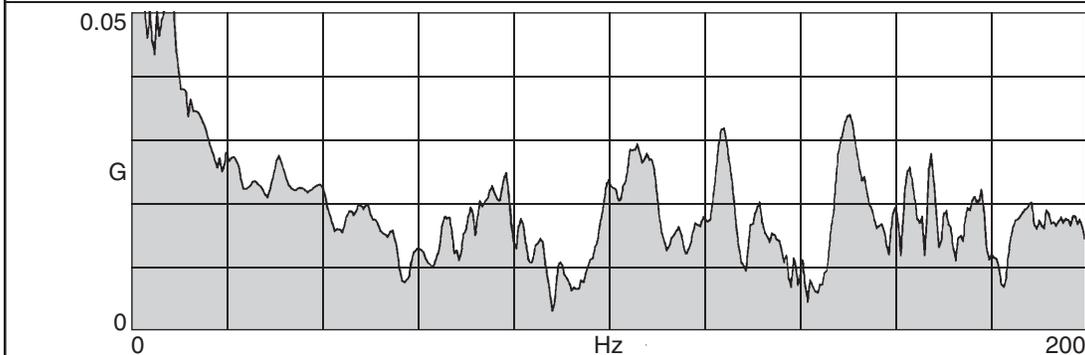
PERFORMING MULTI-CHANNEL VIBRATION SURVEY

### VIBRATION SPECTRUM FROM 0-200 HZ

#### 200 TON PRESS MOUNTED ON COMPETITOR'S MULTI LAYER COMPOSITION PADS



ENERGY IN  
PRESS



RESULTANT  
ENERGY IN  
FLOOR

### COMPETITOR RESULTS

## TEST RESULTS

(continued)

# THE DIFFERENCE

The same press was installed on UNISORB® *Quantum PM™* Press Mounts

Model PM-121-125-TR. Vibrations (when measured from the press foot to the

floor) are virtually eliminated as indicated on the lower curve shown below.



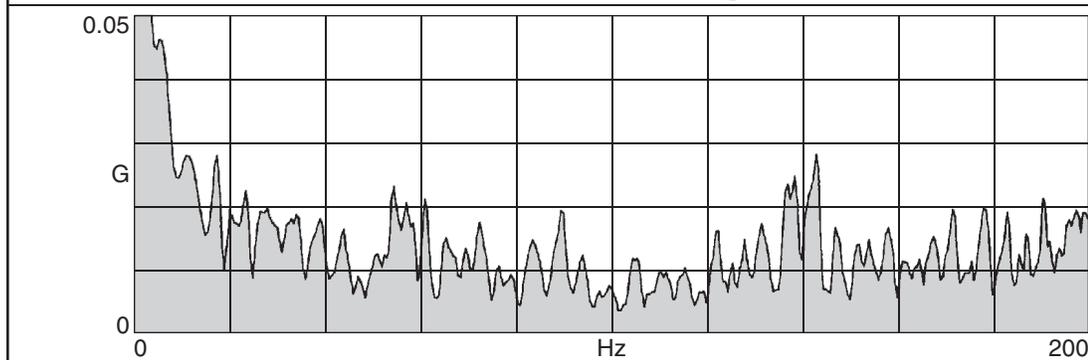
ANALYZING VIBRATION SPECTRA



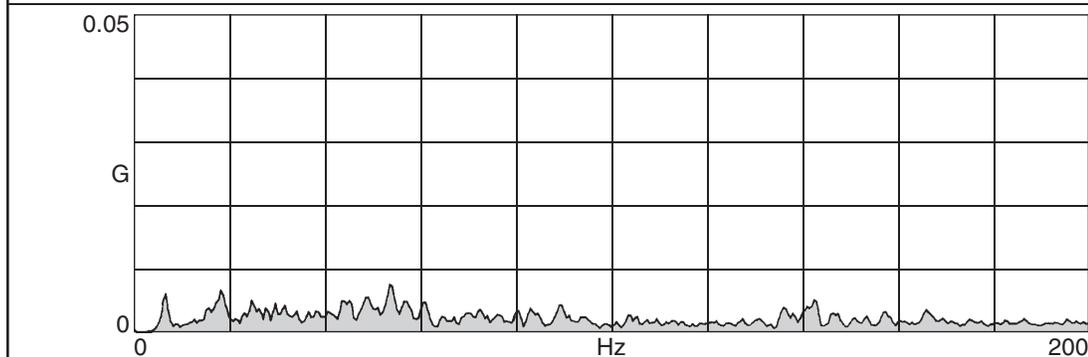
ENGINEERS PREPARING VIBRATION SURVEY REPORT

### VIBRATION SPECTRUM FROM 0-200 HZ

200 TON PRESS MOUNTED ON UNISORB *Quantum PM™* Press Mounts PM-121-125-TR



ENERGY IN PRESS



RESULTANT ENERGY IN FLOOR

## UNISORB® RESULTS

