



Equipment Type: Vacuum Mounting Chamber

Model: **LSSA-001**

Electrical Requirements: 110V/220V pump

Frequency: 50/60 Hz

Motor Horsepower: N/A

Manual Revision Date: April 24, 2024

Please read this instruction manual carefully and follow all installation, operating and safety guidelines.



Vacuum Mounting Chamber

INSTRUCTION MANUAL

3601 E. 34th St. Tucson, AZ 85713 USA Tel. 520-882-6598 Fax 520-882-6599 email: pace@metallographic.com Web: <https://www.metallographic.com>

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Please read this instruction manual carefully and follow all installation, operating and safety guidelines.

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Customer assumes and shall bear the risk of all loss or damage to the Products from every cause whatsoever, whether or not insured, and title to such Products shall pass to Customer upon PACE Technologies delivery of the Products to the common carrier of Pace Technologies choice, or the carrier specified in writing by Customer, for shipment to Customer. Any claims for breakage, loss, delay, or damage shall be made to the carrier by the Customer and Pace Technologies will render customer reasonable assistance in prosecuting such claims.

4. ACCEPTANCE:

Customer shall inspect the Products promptly upon receipt of delivery. Unless customer objects in writing within thirty (30) business days thereafter, customer shall be deemed to have accepted the Products. All claims for damages, errors, or shortage in Products delivered shall be made by Customer in writing within such five (5) business day period. Failure to make any claim timely shall constitute acceptance of the Products.

5. PAYMENT:

Customer agrees to provide timely payment for the Products in accordance with the terms of payment set forth on the reverse side hereof or in any proposal submitted herewith. If any payment is not paid on or before its due date, Customer shall pay interest on such late payment from the due date until paid at the lesser of 12% per annum or the maximum rate allowed by law.

6. DEFAULT:

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7. MISCELLANEOUS PROVISIONS:

This agreement has been made in and shall be governed by the laws of the State of Arizona. These terms and conditions and the description of the Products on the reverse side hereof or in any proposal submitted herewith constitute the entire agreement and understanding of the parties with respect to this sale and supersede all prior and contemporaneous agreements or understandings, inducements or representations, expressed or implied, written or oral, between the parties with respect hereto. Any term or provision of this Agreement may be amended, and any observance of any term of this Agreement may be waived, only by a writing signed by the party to be bound. The waiver by a party of any breach shall not be deemed to constitute a waiver of any other breach. Should suit be brought on this Agreement, the prevailing party shall be entitled to recover its reasonable attorneys' fees and other costs of suit including costs and attorneys' fees incurred on appeal or in collection of any judgment. All claims for damages, errors, or shortage in Products delivered shall be made by Customer in writing within such five (5) business day period. Failure to make any claim timely shall constitute acceptance of the Products.

8. RESTOCKING FEE:

All Returns are subject to a restocking charge equal to 15% (fifteen percent) of the Invoice, unless the Goods are proved to be non-conformed by PACE Technologies.

1.0 Safety Guidelines

1.1 Warning Sign

! This sign points to special safety features on the machine.

1.2 Safety Precautions

! Careful attention to this instruction manual and the recommended safety guidelines is essential for the safe operation of the **Vacuum Mounting Chamber**.

! Proper operator training is required for operation of the **Vacuum Mounting Chamber**. Any unauthorized mechanical and electrical change, as well as improper operation, voids all warranty claims. All service issues need to be reported to the manufacturer /

! Make sure the voltage on the vacuum pump is to the appropriate voltage for the vacuum mounting chamber. The motor of the vacuum pump will overheat if the voltage selector and power supply voltage do not match.

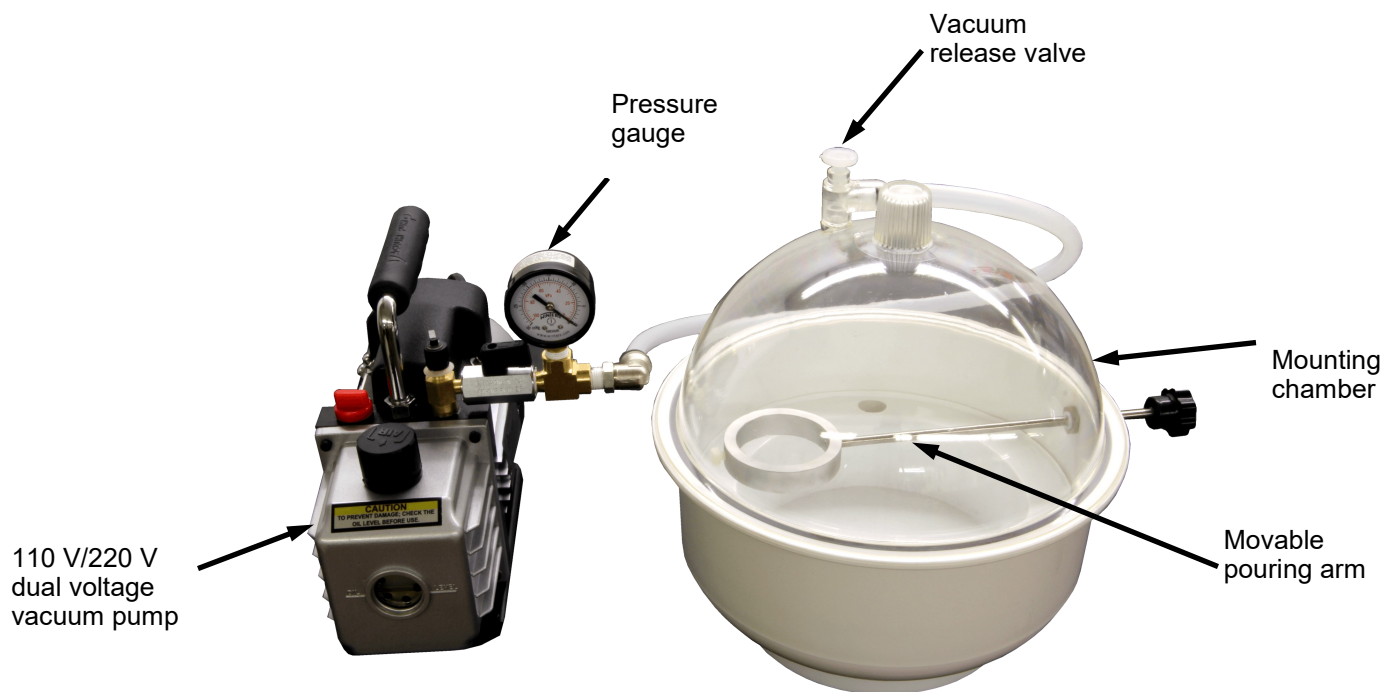
! Operate unit as specified in this manual.

Voltage selector switch **MUST** match power supply! 115V for 110V power supply, 230V for 220V power supply



2.0 Product Description

2.1 General Description



The **Vacuum Mounting Chamber** is designed to fill voids in specimens by first pulling a vacuum, then pouring the resin (epoxy, acrylic or polyester), followed by slowly increasing the pressure in order to force or push the castable resin into the void, pores, cracks or other crevices in the specimen.

2.2 Technical Specifications

Electrical specifications:	110 V / 220 V dual voltage pump
Weight:	Approx. 5 lbs (2.2 kg) without pump Approx. 19 lbs (8.6 kg) with pump
Dimensions (WxDXH):	Approx. 12" x 12" x 12" (300 mm x 300 mm x 300 mm)
Working temperature:	32° - 100°F (0 - 40°C)
Shipping temperature:	32° - 100°F (0 - 40°C)
Storage temperature:	32° - 100°F (0 - 40°C)
Maximum diameter sample	2.5" (65 mm)
Construction	Plastic

3.0 Unpacking, Shipping and Installation

3.1 Unpacking

Unit is delivered in a box. Unpack and check for completeness of parts.

Measures WxHxD: 12" x 12" x 12"

Weight: Approximately 5 lbs without pump
 Approximately 19 lbs with pump

3.2 Shipping

No special consideration



No special consideration

(Installation on following page)

3.3 Installation

! Install unit carefully! Improper installation voids warranty.

The **Vacuum Mounting Chamber** should be placed on a flat stable surface.
Connect vacuum pump or vacuum source.

After connection to vacuum, the system is ready for operation.

Vacuum
connection



Vacuum pump

3.3.1 Filter

Remove cap



Install filter



Replace cap



4.0 Start-up and Operation

4.1 General

The **Vacuum Mounting Chamber** is meant for use with castable mounting resins such as epoxy, acrylic, or polyester.

4.2 Operation Procedure

4.2.1 Add oil to vacuum pump

Remove cap and add oil

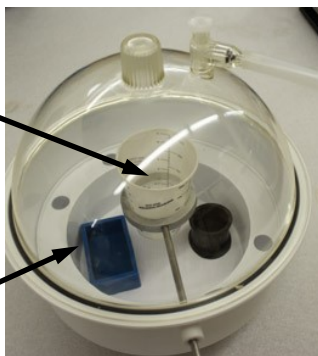


Use sight glass to fill oil to correct level

4.2.2 Mix resin and position molds in chamber

Place mixed resin in pouring cup holder

Locate mounts for pouring



4.2.3 Close valve and pull vacuum

Close valve and
turn on vacuum.
**DO NOT POUR
RESIN YET.**

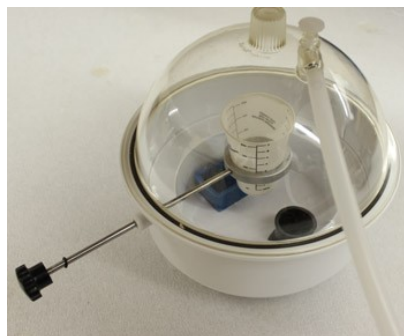


Once the valve is closed, pull vacuum for approximately 1 minute.

Note: do not let resin degass too much - turn off pump when resins begin to froth.

4.2.4 Pour resin under vacuum

Turn off vacuum
and pour resin
into molds



4.2.5 Slowly open valve and let resin cure at room pressure



Open valve slowly.

Note: If the pressure is increased too quickly, the resin will splash all over the chamber creating a mess.

Allow resin to cure at room pressure.

4.4 Metallographic Castable Mounting Basics

Vacuum/Pressure Mounting

Vacuum impregnation is a very useful technique for filling in pores or voids prior to specimen preparation. It is highly useful for thermal spray coatings and other porous samples.

The most effective technique is to pour the resin under vacuum and/or apply pressure during the curing cycle. The advantages include better infiltration of pores and cracks, more transparent mounts, and fewer air bubbles. Figure 1 shows an example of a vacuum impregnation device for this purpose.



Figure 1 Vacuum impregnation device.

For porous or cracked specimens, the resin can aid in supporting these features. Filling these voids can be difficult depending upon their size, with smaller voids being much more resistant to impregnation than larger voids. This arises mainly because of the compressibility and volume of air within the void. By applying a vacuum to the specimen and then pouring the resin while under vacuum, the total pressure of the air bubbles can be reduced significantly. Subsequent curing at increased pressures will force or push the resin into the voids. Note that the vacuum time on both the resin and specimen should be kept to a minimum in order to minimize degassing of the resin.

$PV = nRT$ (gas law)

P - Pressure

V - Volume

T - Temperature

$$V(\text{bubble size}) = \frac{nRT}{P}$$

Thus, in order to decrease the air bubble size, impregnate at low pressures and cure at higher pressures.

Recommended Procedure:

1. Place mold and sample into impregnation chamber.
2. Mix castable mounting resin.
3. Place cover on chamber and pull vacuum.
4. Pour resin into mount.
5. Slowly increase the pressure.
6. Allow the mount to cure at room pressure or apply an external pressure.

TIP: Do not pull vacuum for more than 60 seconds. Extended vacuum causes the dissolved gases in the liquid resin to degass and bubble (similar to opening up a carbonated beverage bottle).

TIP: To reduce the curing time, preheat resin, hardener, and specimen to 30°C (85°F). **Note:** this will also increase maximum exotherm.

TIP: Slight preheating of the epoxy will also reduce the viscosity of the resin and allow it to flow better.

5.0 Maintenance

5.1 Introduction

The **Vacuum Mounting Chamber** requires very minimal maintenance. To increase the life of the chamber, make sure to clean any excess resin after usage. To increase the life of the vacuum pump, change the vacuum pump oil after 50 hours of usage.

5.2 Cleaning cover

The cover should be cleaned occasionally with a moistened cloth. Do not use any chemicals or cleaning abrasives.

6.0 Troubleshooting

Problem	Cause	Solution
Resin splattering	Increasing pressure too fast	Open valve slowly

7.0 Recommended Consumables



Reusable rubber molds



2-piece reusable molds



Specimen mounting clips, plastic or metal



Epoxy resins












Acrylic resins





Polyester resins

8.0 List of Spare Parts

Part no.	Description	Image
Electrical		
VAC-PUMP	110V/220V dual voltage vacuum pump	
Mechanical		
VAC-001	Cup Holder Ring	
VAC-P-PCH	Pouring cup holding bolt	
VAC-002	Pouring Rod	
VAC-SOR	Vacuum rod sealing O-rings	
VAC-003	Vacuum Release Valve	
VAC-P-PRC	Pressure release cock	

Part no.	Description	Image
Mechanical		
VAC-TOP	Vacuum impregnation cover	
VAC-VBO	Vacuum bowl	
VAC-VCFBO	Vacuum inside chamber flat bowl	
VAC-RGFI	Pouring rod guide fitting	
VAC-RGFN	Pouring rod guide fitting retaining nut	
VAC-RING	Vacuum chamber O-ring	
Vacuum components		
VAC-P-PGFI	Vacuum pressure gauge street fitting	

Part no.	Description	Image
Vacuum components		
VAC-P-PTFIT	Vacuum pressure gauge T-fitting	
VAC-P-PGEL	Vacuum pressure gauge street elbow	
VAC-P-PHGFI	Vacuum pressure gauge spring hose fitting	
VAC-HC	Vacuum hose	
VAC-POIL	Vacuum pump oil	
POUR-CUP	125 ml plastic beakers	
VF-010	110V pump air filters	
VAC-GAUGE	Vacuum pressure gauge	