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|---------------------------------|--------------------|
| <u>Equipment Type:</u> | Belt Grinder |
| <u>Model:</u> | PENTA-7500S |
| <u>Electrical Requirements:</u> | 110 / 220 Volts |
| <u>Frequency:</u> | 50 / 60 Hz |
| <u>Motor Power</u> | 0.75hp |
| <u>Manual Revision Date:</u> | November 1, 2023 |

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

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WARRANTY

Terms and Conditions applying to all PACE Technologies Products

1. LIMITED WARRANTY AND DISCLAIMER:

PACE Technologies Products are warranted for two years from the purchase date to be free from defects in material and workmanship under correct use, normal operating conditions, and proper application. PACE Technologies obligation under this warranty shall be limited to the repair or exchange, at PACE Technologies option, of any PACE Technologies Product or part which proves to be defective as provided herein. PACE Technologies reserves the right to either inspect the product at Buyer's location or require it to be returned to the factory for inspection. Buyer is responsible for freight to and from factory on all warranty claims. The above warranty does not extend to goods damaged or subjected to accident, abuse or misuse after release from PACE Technologies warehouse, nor goods altered or repaired by anyone other than specifically authorized PACE Technologies representatives. PACE Technologies shall not in any way be responsible for the consequences of any alteration, modification or misuse unless previously approved in writing by an officer of PACE Technologies. Note: Corrosion is considered a maintenance issue and not a warranty issue.

PACE TECHNOLOGIES MAKES NO EXPRESS WARRANTIES OTHER THAN THOSE WHICH ARE SPECIFICALLY DESCRIBED HEREIN. Any description of the goods sold hereunder, including any reference to Buyer's specifications and any description in catalogs, circulars and other written material published by PACE Technologies, is the sole purpose of identifying such goods and shall not create an express warranty that the goods shall conform to such description.

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2. LIABILITY CAP:

PACE Technologies maximum aggregate liability for loss and damage arising under, resulting from or in connection with the supply or use of the Equipment and Consumables provided under this purchase, or from the performance or breach of any obligation (s) imposed hereunder, whether such liability arises from any one or more claims or actions for breach of contract, tort, (including negligence), delayed completion, warranty, indemnity, strict liability or otherwise, unless otherwise limited by the terms hereof, shall be limited to one hundred percent (100%) of the purchase price.

3. DELIVERY:

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:

If Buyer is in default (including, but not limited to, the failure by Buyer to pay all amounts due and payable to Seller) under the work or purchase order or any other agreement between Buyer and Seller, Buyer's rights under the warranty shall be suspended during any period of such default and the original warranty period will not be extended beyond its original expiration date despite such suspension of warranty rights.

7. MISCELLANEOUS PROVISIONS:

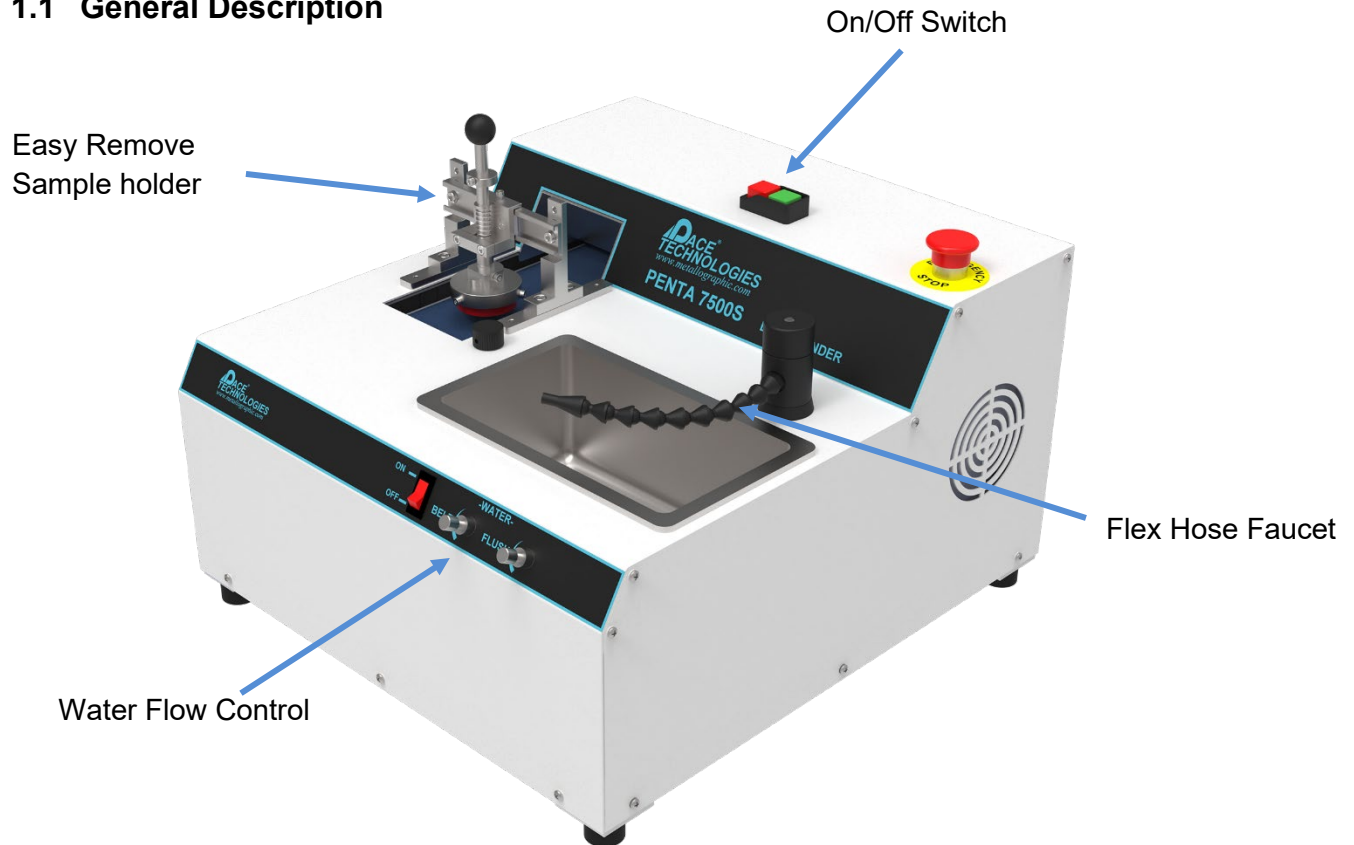
This agreement has been made in and shall be governed by the laws of the State of Arizona. All disputes arising under or relating to the purchase of the equipment shall be brought and resolved solely and exclusively in the State of Arizona, Pima County. These terms and conditions and the description 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., 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 Product Description

1.1 General Description



The PENTA 7500S is a single belt hand grinder for coarse grit specimen planarization. A unique benefit of the PENTA-7500S belt grinder is the fixture for planarizing specimen mounts. This is very important for maintaining a square mount for automated polishing machines.

Another benefit is a high 0.75 horsepower motor that is capable of running the belt with enough torque to remove material from any sample.

A rinse station also allows for the sample to be easily cleaned after grinding.

1.2 Technical Specifications

| | |
|-----------------------------------|--|
| <u>Electrical Specifications:</u> | 110 / 220 Volts, 50 / 60 Hz |
| <u>Roll Sizes:</u> | 4-inch width x 36-inch length |
| <u>Motor Power</u> | 0.75 hp (550W) |
| <u>Machine Weight:</u> | Approx. 112lbs (50 kg) |
| <u>Dimensions (W x H x D):</u> | Approx. 19.5 x 22 x 16-inches (495 mm x 560 mm x 410 mm) |
| <u>Working Temperature:</u> | 32° - 100°F (0 – 40°C) |
| <u>Shipping Temperature:</u> | 32° - 130°F (0 – 54°C) |
| <u>Storage Temperature:</u> | 32° - 100°F (0– 40°C) |
| <u>Belt Speed:</u> | 43 ft/second (13m/s) |
| <u>Construction:</u> | Fabricated Steel with stainless steel components to reduce corrosion |

2.0 Unpacking, Shipping and Installation

2.1 Unpacking

The PENTA-7500S is shipped in a customized box. Unpack the foam, which is covering the machine, from the box. Then remove the unit from the remaining foam.

2.2 Shipping

When moving machine, lift by the base.

The **PENTA-7500S** is constructed with sensitive electronic and mechanical components.



DO NOT DROP.

! Caution: Use care when moving machine

Measures WxDxH: 21" x 29" x 22" (535 x 740 x 560 mm)

Weight: Weight with crate (approximately 140 lbs).

2.3 Installation

! Install unit carefully! Improper installation voids warranty.

The **PENTA 7500S** should be placed on a flat stable surface.

Connect to water supply, drain and electrical outlet (110V or 220V, note voltage has been prewired at the factory). After water and drain are completed, the system is ready for operation.

3.0 Safety Guidelines

3.1 Warning Sign

! This sign points to special safety features on the machine

3.2 Safety Precautions

! Careful attention to this instruction manual and the recommended safety guidelines is essential for the safe operation of the **PENTA 7500S**.

! Proper operator training is required for the operation of the **PENTA 7500S**. 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 supplier.

! Operate unit as specified in this manual

! Do not leave any specimen or other parts on the working surface

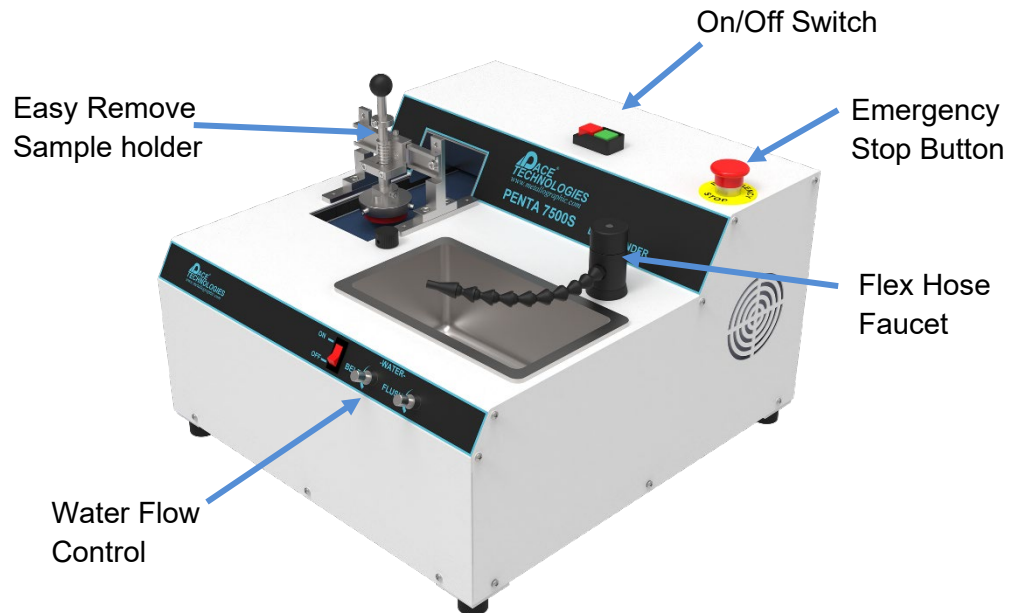
! When unit is not in use, turn off the water

! Securely hold the sample, preferably with two hands when not using the specimen holder

4.0 Start-Up and Operation

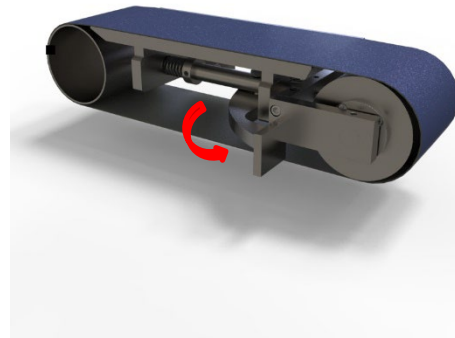
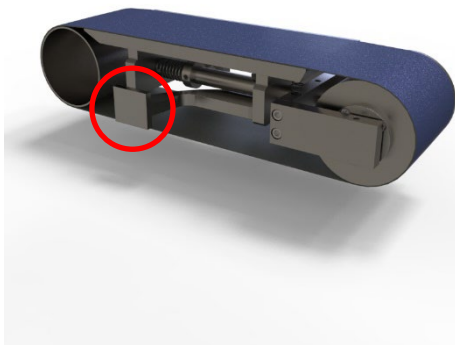
4.1 General

The PENTA-7500S is a belt grinder specifically designed for metallographic sample planarization.

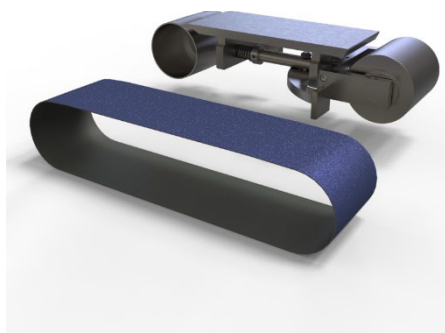


4.2 Loading Belts

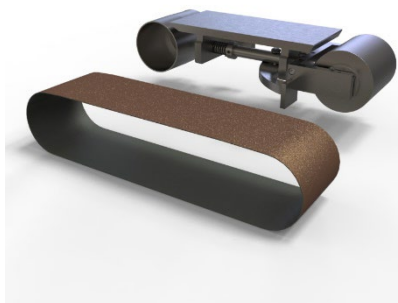
1. Open the side panel of the PENTA-7500S and locate the pull arm.
2. Rotate the pull arm to move the front wheel and release tension on the belt.



3. Remove the belt by sliding it off the wheel



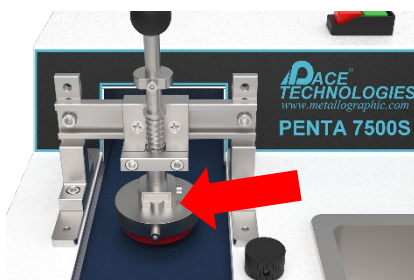
4. Locate new belt



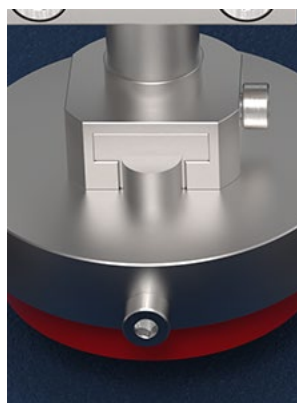
5. Slide new belt on and reposition pull arm to re-tension the belt



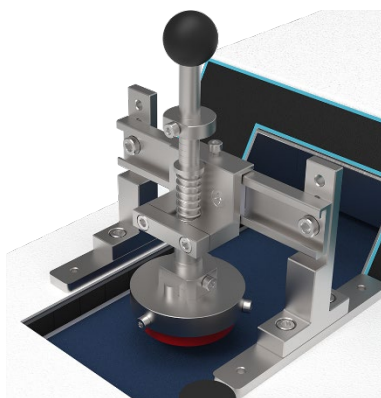
4.3 Mounting Specimens in Fixture



1. Remove Holder by loosening screw and sliding it out of the slot



2. Insert sample into the correct sample size holder using the loading plate and tighten screws to hold the specimen mount



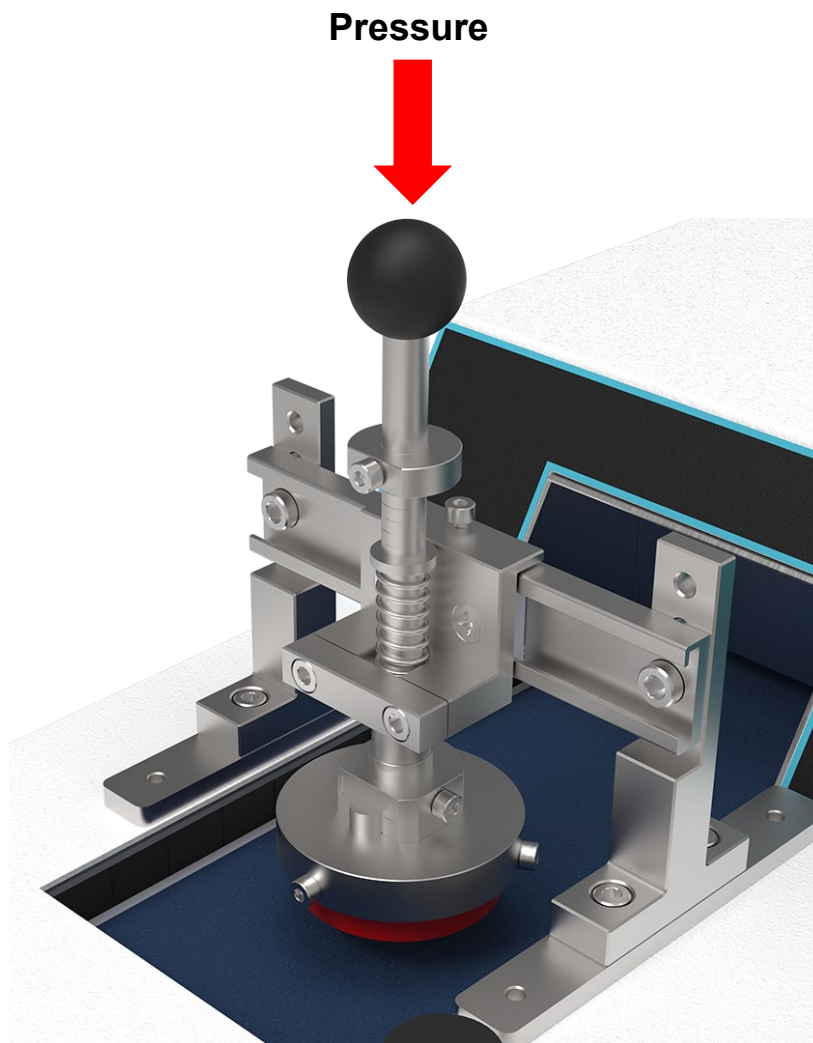
3. Slide Holder back into the slot. Push down on handle to apply pressure to sample while grinding

| PENTA-7500S holder | Catalog No. |
|--------------------|-------------|
| 1-inch | P75-SH-100 |
| 1.25-inch | P75-SH-125 |
| 1.5-inch | P75-SH-150 |
| 2-inch | P75-SH-200 |
| | |
| 25 mm | P75-SH-25 |
| 30 mm | P75-SH-30 |
| 40 mm | P75-SH-40 |
| 50 mm | P75-SH-50 |

4.4 Grinding Samples

After mounting the sample and placing the sample holder inside the slot start the machine. Activate the water and adjust flow to preferred levels. Push down on the sample holder handle to apply pressure to the sample. Do not move sample holder back and forth during grinding.

The holder is spring enabled. If pressure is released to sample will not grind on the paper



4.4 Metallographic Specimen preparation Basics

Typical metallographic specimen preparation consists of the following steps:

| <u>Preparation Stage</u> | <u>Purpose</u> |
|---------------------------------|---|
| Initial Documentation | <ul style="list-style-type: none">• Document the initial condition of the sample• Map the sample surface• Highlight the area of interest |
| Sectioning/Cutting | <ul style="list-style-type: none">• Reduce the size of large samples• Reduce sample size closest to the area of interest |
| Rough, or Planar Grinding | <ul style="list-style-type: none">• Obtain a planar surface• Remove sectioning damage• Approach the area of interest |
| Rough Polishing | <ul style="list-style-type: none">• Remove all the subsurface damage and microstructural damage produced during cutting and rough grinding (superficial scratches may still be present after this step) |
| Final Polishing | <ul style="list-style-type: none">• Generally, more for cosmetic purposes than for removing microstructural damage. In most cases, this stage should be minimized to avoid over polishing and distorting the microstructural features |
| Etching | <ul style="list-style-type: none">• To enhance microstructural feature such as grain boundaries, grain size, phase differences, etc. |
| Examination | <ul style="list-style-type: none">• A variety of examination techniques are used in metallography, including optical microscopy, electron microscopy, and hardness testing |

5.0 Maintenance

5.1 Introduction

The **PENTA 7500S** requires very minimal maintenance. However, to increase the life of the grinder, it is suggested that the unit be rinsed after use.

5.2 Cleaning Inside Cabinet

The inside of the cabinet where the belt mechanism is located should be cleaned and dried to avoid possible corrosion. It is advised to leave the side panel open when finished using the machine to reduce humidity and allow air flow. Do not use chemical or cleaning abrasives on the inside of the cabinet.

5.2 Cleaning Outside Cabinet

The outside cabinet should be cleaned occasionally with a moist cloth. Do not use any chemicals or cleaning abrasives while cleaning.

6.0 Trouble Shooting

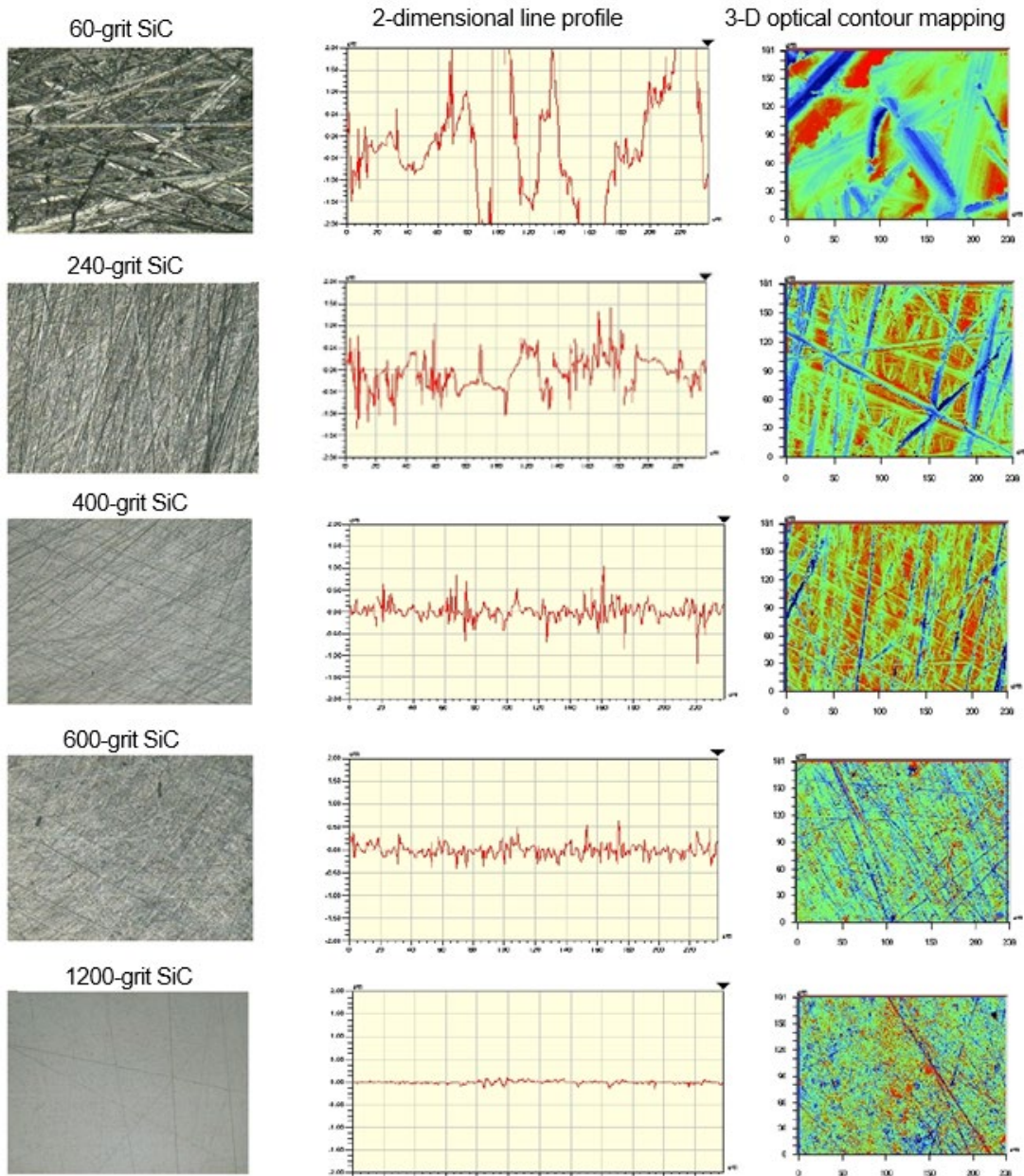
More extensive troubleshooting, repair guides, videos, and parts lists are provided online at metallographic.com.

Feel free to contact a PACE Representative at +1(520) 882-6598

| Problem | Cause | Solution |
|-----------------|---|--|
| No water supply | 1. Water valve closed 2. Water tube is extremely bent | 1. Open the water valve 2. Straighten out water tube |
| Water leaking | 1. Door is not closed completely 2. Drain hose plugged 3. Unit not tilted properly 4. Water flow is too high | 1. Ensure nothing is blocking door from closing 2. Clean drain hose 3. Adjust front feet to slope towards drain hole 4. Reduce water flow to allow system to drain properly |

7.0 Metallographic Consumables

7.1 Abrasive Paper, Surface Roughness



7.2 Replacement Belts

| Part No. | Quantity | Description |
|-----------|----------|--|
| ZrO2-B060 | 5/box | Long lasting durable 60 grit zirconia grinding belt, recommended for course grinding (4"x36") |
| ZrO2-B120 | 5/box | Long lasting durable 120 grit zirconia grinding belt, recommended for course grinding (4"x36") |
| ALO-B120 | 5/box | 120 grit, moderate life alumina belt (4"x36") |
| SIC-B60 | 10/box | 60-grit SiC belt (4"x36") |
| SIC-B80 | 10/box | 80-grit SiC belt (4"x36") |
| SIC-B120 | 10/box | 120-grit SiC belt (4"x36") |
| SIC-B180 | 10/box | 180-grit SiC belt (4"x36") |
| SIC-B240 | 10/box | 240-grit SiC belt (4"x36") |
| SIC-B320 | 10/box | 320-grit SiC belt (4"x36") |
| SIC-B400 | 10/box | 400-grit SiC belt (4"x36") |
| SIC-B600 | 10/box | 600-grit SiC belt (4"x36") |



Various Belt Types